FILE NO.

SERVICE MANUAL (SUPPLEMENT)

Remote Control Color Television

DS32224 (U.S.A.) (CANADA)

ORIGINAL VERSION

Chassis No. 32224-00

NOTE: Match the Chassis No. on the unit's back cover with the Chassis No. in the Service Manual.

If the Original Version Service Manual Chassis No. does not match the unit's, additional Service Literature is required. You **must** refer to "Notices" to the Original Service Manual prior to servicing the unit.

THIS CHASSIS IS SIMILAR TO MODEL DS31820, CHASSIS NUMBER 31820-00. SERVICE INFORMATION GIVEN IN THIS MANUAL IS ONLY THE DIFFERENCE INFORMATION FROM MODEL DS31820, CHASSIS NUMBER 31820-00. FOR ADDITIONAL SERVICE INFORMATION, REFER TO THE SERVICE MANUAL FOR CHASSIS NUMBER 31820-00 USED IN MODEL DS31820 (SM780083).

G7TPA, PRODUCT CODE 111370488

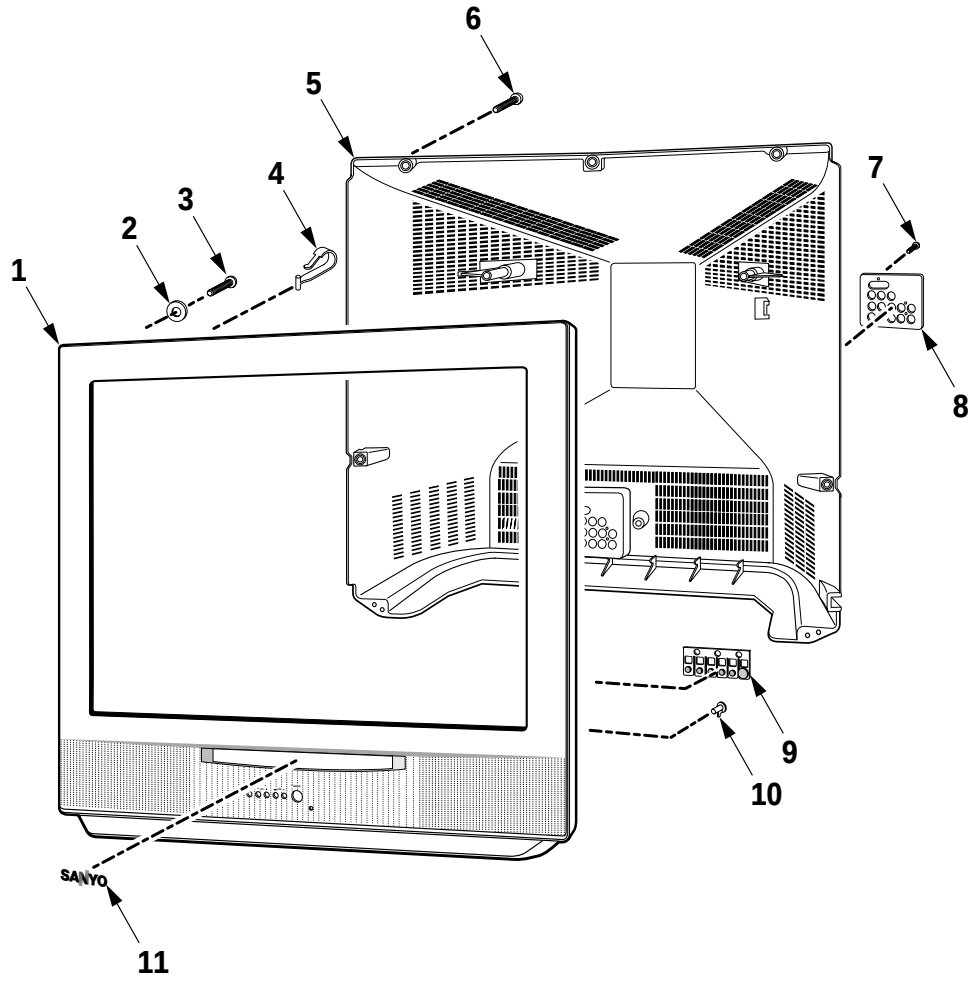
REFERENCE No. SS780048

DIFFERENCES

MODEL DS32224 (Chassis No. 32224-00) — SAME AS MODEL DS31820 (Chassis No. 31820-00) EXCEPT:

1. IN THE CABINET / ACCESSORY PARTS LIST

KEY NO.	MODEL DS31820 (Chassis No. 31820-00)		MODEL DS32224 (Chassis No. 32224-00)	
	Part No.	Description	Part No.	Description
1	610 295 9048	CABINET FRONT ASSY	610 312 2113	CABINET FRONT ASSY
9	610 295 7884	BUTTON UNIT	610 312 3981	BUTTON UNIT
10	610 267 0851	CAP RC	610 265 3786	CAP RC
	610 299 5763	DEC SHEET	N/A	NOT USED
11	610 293 2560	SANYO BADGE	610 312 5008	SANYO BADGE
	610 299 9600	OWNER'S MANUAL	610 312 0942	OWNER'S MANUAL
	645 052 5018	RC TRANSMITTER	645 058 8150	RC TRANSMITTER



2. IN THE CHASSIS ELECTRICAL PARTS LIST

KEY NO.	MODEL DS31820 (Chassis No. 31820-00)		MODEL DS32224 (Chassis No. 32224-00)	
	Part No.	Description	Part No.	Description
A100	610 300 2125	ASSY, PWB, MAIN	610 312 2564	ASSY, PWB, MAIN
A700	610 300 6802	ASSY, PWB, CRT	610 312 2571	ASSY, PWB, CRT
A1000	610 300 2132	ASSY, PWB, AV	610 312 2588	ASSY, PWB, AV
Q901	414 010 6905	CRT M78JUA361X72	414 010 7001	CRT M80JUA068X72

For parts or service contact

SANYO FISHER SERVICE

21605 Plummer Street
Chatsworth, CA 91311 (U.S.A.)

300 Applewood Crescent,
Concord, Ontario L4K 5C7 (CANADA)

March / 2004 / 2000 SMC

Printed in U.S.A.

SANYO

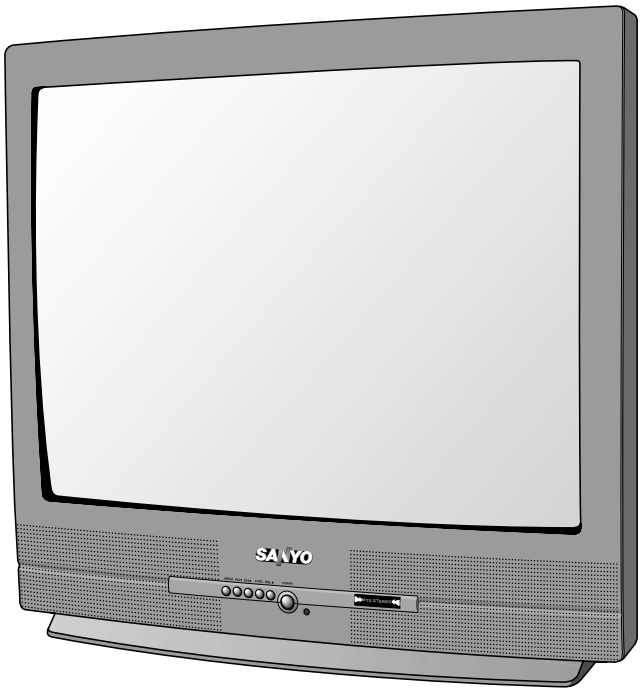
FILE NO.

SERVICE MANUAL

Remote Control Color Television

DS31820 (U.S.A.) (CANADA)

ORIGINAL VERSION



Chassis No. 31820-00

NOTE: Match the Chassis No. on the unit's back cover with the Chassis No. in the Service Manual.

If the Original Version Service Manual Chassis No. does not match the unit's, additional Service Literature is required. You **must** refer to "Notices" to the Original Service Manual prior to servicing the unit.

Contents

Safety Instructions 2
Service Adjustments . . . . . 3 - 10
Service Hints 10
Mechanical Disassemblies 11
Chassis Electrical Parts List . . . . . 12 - 23
Cabinet Parts List 24
Component and Test Point Locations . . . . . 25 - 28
Schematic Insert . . . . . 29 - 36
Schematic Notes 29
Pin Layouts 29
Capacitor and Resistor Codes 29
Block Diagram . . . . . 30 - 31
Voltage Charts . . . . . 30 - 32
Waveforms 32
Main PC Board . . . . . 33 - 36
Audio/Video Board . . . . . 35 - 36
CRT Socket Board 33

Specifications

Power Rating	120V, 60Hz 89W (Avg), 2.5A (Max)
Antenna Input Impedance	75Ω UHF/VHF/CATV
Receiving Channel	2 - 13 (VHF), 14 - 69 (UHF), 01, 14-94, 95-125 (CATV)
Remote Ready	43 Key Remote Control
Sound Output	1.0 W/CH
Intermediate Frequency	
Picture IF Carrier	45.75MHz
Sound IF Carrier	41.25MHz
Color Sub Carrier	42.17MHz
Picture Tube	M78JUA361X72
Semiconductors	
Integrated Circuits	15
Transistors	41 Except within Tuner and RC Pre-Amp.
Cabinet Dimensions	
Width	754 mm
Height	732 mm
Depth	538 mm

SAFETY INSTRUCTIONS

SAFETY PRECAUTIONS

WARNING: The chassis of this receiver has a floating ground with the potential of one half the AC line voltage in respect to earth ground. Service should not be attempted by anyone not familiar with the precautions necessary when working on this type of equipment.

The following precautions must be observed:

1. An isolation transformer must be connected in the power line between the receiver and the AC line before any service is performed on the receiver.

2. Comply with all caution and safety-related notes provided on the side of the cabinet, inside the cabinet, on the chassis, and the picture tube.

3. When replacing a chassis in the cabinet, always be certain that all the protective devices are installed properly, such as control knobs, adjustment covers, shields and barriers.

   DO NOT OPERATE THIS TELEVISION RECEIVER WITHOUT THE PROTECTIVE SHIELD IN POSITION AND PROPERLY SECURED.

4. Before replacing the back cover of the set, thoroughly inspect the inside of the cabinet to see that no stray parts or tools have been left inside.
   Before returning any television to the customer, the service technician must perform the following safety checks to be sure that the unit is completely safe to operate without danger of electrical shock.

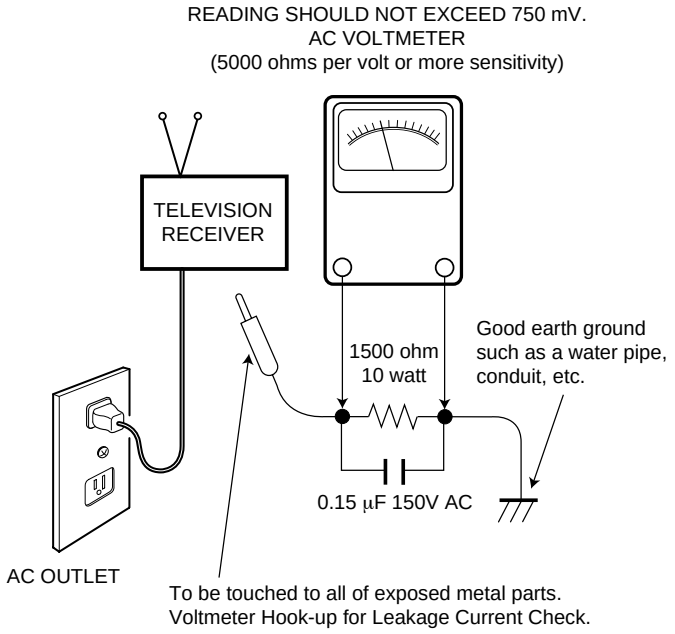
ANTENNA COLD CHECK

Remove AC plug from the 120 VAC outlet and place a jumper across the two blades. Connect one lead of an ohmmeter to the jumpered AC plug, and touch the other lead to each exposed antenna terminal (UHF and VHF antenna terminals). The resistance must measure between 1M ohm and 5.2M ohm. Any resistance value below or above this range indicates an abnormality which requires corrective action.

LEAKAGE CURRENT CHECK

Plug the AC line cord directly into a 120 VAC outlet. (Do not use an isolation transformer for this check.) Use an AC voltmeter, that has 5000 ohms per volt or more sensitivity. Connect a 1500 ohm 10 watt resistor, paralleled by a 0.15 µF 150 VAC capacitor, between a known good earth ground (water pipe, conduit, etc.) and all exposed metal parts of the cabinet (antennas, handle bracket, metal cabinet, screw heads, metal overlays, control shafts, etc.). Measure the AC voltage across the 1500 ohm resistor. The AC voltage should not exceed 750 mV. A reading exceeding 750 mV indicates that a dangerous potential exists. The fault must be located and corrected. Repeat the above test with the receiver power plug reversed.

NEVER RETURN A RECEIVER TO THE CUSTOMER WITHOUT TAKING THE NECESSARY CORRECTIVE ACTION.


READING SHOULD NOT EXCEED 750 mV.
AC VOLTMETER
(5000 ohms per volt or more sensitivity)
TELEVISION RECEIVER
1500 ohm 10 watt
Good earth ground such as a water pipe, conduit, etc.
0.15 µF 150V AC
AC OUTLET
To be touched to all of exposed metal parts.
Voltmeter Hook-up for Leakage Current Check.

X-RADIATION PRECAUTION

The primary source of X-RADIATION in solid-state receivers is the picture tube. The picture tube is specially constructed to limit X-Ray emission. For continued X-RADIATION protection, the replacement tube must be the same type as the original (including the suffix letter in the part numbers). Excessive high voltage may produce potentially hazardous X-RADIATION. To avoid such hazards, the high voltage must be maintained within specific limits. Refer to the X-RADIATION WARNING NOTE on the CHASSIS SCHEMATIC in this service manual for specific high voltage limits. If the high voltage exceeds specified limits, check the components specified on the chassis schematic diagram and take the necessary corrective action. Carefully follow the instructions for the +B Voltage Check and the High Voltage Check to maintain the high voltage within the specified limits.

HIGH VOLTAGE HOLD-DOWN TEST

To prevent X-RADIATION from the picture tube due to excessive high voltage, a HOLD-DOWN circuit is provided in the high voltage circuit. Every time the receiver is serviced, the high voltage HOLD-DOWN circuit must be tested for proper operation. Refer to the HIGH VOLTAGE HOLD-DOWN TEST in service adjustments.

PRODUCT SAFETY NOTICE

When replacing components in a receiver, always keep in mind the necessary product safety precautions. Pay special attention to the replacement of components marked with a star (★) in the parts list and in the schematic diagrams. To ensure safe product operation, it is necessary to replace those components with the exact same PARTS.

SERVICE ADJUSTMENTS

GENERAL

This set has an On-screen Service Menu system included in the CPU that allows remote operation for most of the service adjustments.

ON-SCREEN SERVICE MENU SYSTEM

1. **Enter the Service Menu:**
   - While pressing the MENU key, reconnect the AC power cord. The Service Menu Display will now appear. (See Figure 1.)

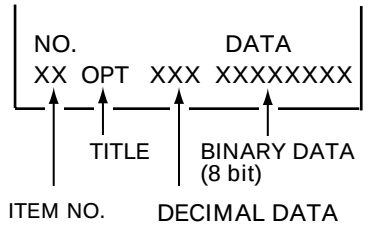


Figure 1. Service Menu Display

2. **Service Adjustments:**
   - Press the ▲ or ▼ key to select the desired service menu you want to adjust. (See page 5 for On-screen Service Menu.)
   - Use the + or – key to adjust the data.
3. **Exit from the Service Menu:**
   - Press the MENU key to turn off the Service Menu display.

IC802 (EEPROM) REPLACEMENT

When IC802 (EEPROM) is replaced, IC801 (CPU) will automatically write the initial reference data into IC802 for basic TV operation. However, the bus data should be checked and some bus data should be set up before attempting the service adjustments. (See pages 5 – 7 for detailed bus data information.)

INITIAL BUS DATA SETUP

Note: When IC802 (EEPROM) is replaced, change the following initial reference data for proper TV operation before attempting service adjustments.

1. Disconnect the AC power cord (AC 120V line).
2. While pressing the MENU key, reconnect the AC power cord. The Service Menu display will now appear.
3. Select NO. 4 VS (V Size) with ▲ or ▼ key. Adjust the data with + or – key for 17.
4. Select NO. 5 VLN (V Linearity) with ▲ or ▼ key. Adjust the data with + or – key for 8.
5. Select NO. 6 VSC (V S Correction) with ▲ or ▼ key. Adjust the data with + or – key for 2.
6. Select NO. 7 HP (H Position) with ▲ or ▼ key. Adjust the data with + or – key for 24.
7. Select NO. 8 EWD (H Width) with ▲ or ▼ key. Adjust the data with + or – key for 34.
8. Select NO. 9 EWA (Pincushion Amp) with ▲ or ▼ key. Adjust the data with + or – key for 35.
9. Select NO. 10 EWP (Upper Corner Pincushion) with ▲ or ▼ key. Adjust the data with + or – key for 34.
10. Select NO. 12 BOW (AFC Bow) with ▲ or ▼ key. Adjust the data with + or – key for 7.
11. Select NO. 13 ANG (AFC Angle) with ▲ or ▼ key. Adjust the data with + or – key for 8.
12. Select NO. 14 UVL (Upper V Lin) with ▲ or ▼ key. Adjust the data with + or – key for 0.
13. Select NO. 15 LVL (Lower V Lin) with ▲ or ▼ key. Adjust the data with + or – key for 0.
14. Select NO. 16 EWT (Pincushion Phase) with ▲ or ▼ key. Adjust the data with + or – key for 4.
15. Select NO. 17 VC (V Compression) with ▲ or ▼ key. Adjust the data with + or – key for 5.
16. Select NO. 21 RB (Red Cutoff) with ▲ or ▼ key. Adjust the data with + or – key for 6.
17. Select NO. 22 GB (Green Cutoff) with ▲ or ▼ key. Adjust the data with + or – key for 0.
18. Select NO. 23 BB (Blue Cutoff) with ▲ or ▼ key. Adjust the data with + or – key for 0.
19. Select NO. 26 STI (Sub Tint) with ▲ or ▼ key. Adjust the data with + or – key for 15.
20. Select NO. 27 SCO (Sub Color) with ▲ or ▼ key. Adjust the data with + or – key for 9.
21. Select NO. 28 SB (Sub Bright) with ▲ or ▼ key. Adjust the data with + or – key for 12.
22. Select NO. 29 SSH (Sub Sharpness) with ▲ or ▼ key. Adjust the data with + or – key for 2.

SERVICE ADJUSTMENTS (Cont.)

INITIAL BUS DATA SETUP (Cont.)

23. Select NO. 33 DCO (Dynamic Color Switch) with ▲ or ▼ key. Adjust the data with + or – key for 0.
24. Select NO. 39 DCR (DC Reset) with ▲ or ▼ key. Adjust the data with + or – key for 3.
25. Select NO. 40 YGM (Y Gamma Correction) with ▲ or ▼ key. Adjust the data with + or – key for 2.
26. Select NO. 51 HBR (H Blanking Right) with ▲ or ▼ key. Adjust the data with + or – key for 0.
27. Select NO. 60 OPT (SA Option 1) with ▲ or ▼ key. Adjust the data with + or – key for 32.
28. Select NO. 61 OP2 (SA Option 2) with ▲ or ▼ key. Adjust the data with + or – key for 82.
29. Select NO. 62 HR (OSD Position) with ▲ or ▼ key. Adjust data with + or – key for 34.
30. Select NO. 63 SCA (Sub Color) with ▲ or ▼ key. Adjust data with + or – key for 2.
31. Select NO. 64 STA (Sub Tint Offset) with ▲ or ▼ key. Adjust the data with + or – key for 254.
32. Select NO. 67 SBT (Sub Tint) with ▲ or ▼ key. Adjust the data with + or – key for 5.
33. Select NO. 68 SBL (Sub Color) with ▲ or ▼ key. Adjust the data with + or – key for 12.
34. Select NO. 70 RTN (Tint Offset for RF) with ▲ or ▼ key. Adjust the data with + or – key for 0.
35. Select NO. 71 RCL (Color Offset for RF) with ▲ or ▼ key. Adjust the data with + or – key for 0.
36. Select NO. 74 PPR (Preshoot/Overshoot Ratio for RF) with ▲ or ▼ key. Adjust the data with + or – key for 1.
37. Select NO. 79 DTN (Tint Offset for YUV) with ▲ or ▼ key. Adjust the data with + or – key for 4.
38. Select NO. 80 DCL (Color Offset for YUV) with ▲ or ▼ key. Adjust the data with + or – key for 16.
39. Select NO. 92 EVB (Vertical Blanking Width Top for 16:9) with ▲ or ▼ key. Adjust the data with + or – key for 2.
40. Select NO. 95 EVA (Vertical Size Offset for 16:9) with ▲ or ▼ key. Adjust the data with + or – key for 22.
41. Select NO. 97 SED (H Width Offset for 16:9) with ▲ or ▼ key. Adjust the data with + or – key for 255.
42. Select NO. 98 SEA (Pin Offset for 16:9) with ▲ or ▼ key. Adjust the data with + or – key for 255.
43. Select NO. 103 VAP (Vertical Aspect) with ▲ or ▼ key. Adjust the data with + or – key for 26.
44. Select NO. 104 VSR (Vertical Scroll) with ▲ or ▼ key. Adjust the data with + or – key for 31.
45. Select NO. 105 ATT (MTS Input Level) with ▲ or ▼ key. Adjust the data with + or – key for 6.
46. Select NO. 106 WDB (MTS Low Separation) with ▲ or ▼ key. Adjust the data with + or – key for 31.
47. Select NO. 107 SPC (MTS Hi Separation) with ▲ or ▼ key. Adjust the data with + or – key for 21.
48. Select NO. 109 PCO (PIP Chroma Gain) with ▲ or ▼ key. Adjust the data with + or – key for 40.
49. Select NO. 110 PTI (PIP Tint) with ▲ or ▼ key. Adjust the data with + or – key for 40.
50. Select NO. 111 PUV (PIP Top Location) with ▲ or ▼ key. Adjust the data with + or – key for 26.
51. Select NO. 113 PLH (PIP Left Location) with ▲ or ▼ key. Adjust the data with + or – key for 13.
52. Select NO. 114 PRH (PIP Right Location) with ▲ or ▼ key. Adjust the data with + or – key for 105.
53. Select NO. 115 PCN (PIP Y Signal Gain) with ▲ or ▼ key. Adjust the data with + or – key for 43.
54. Press the MENU key to turn off the Service Menu display.

Table 1. ON-SCREEN SERVICE MENU

When IC802 (EEPROM) is replaced, check the bus data to confirm they are the same as below. The shaded menu should be checked and be set up or readjusted according to the procedures described in the following pages. Initial Setup Data marked with an * should be changed from Initial Reference Data. (See pages 3 and 4 for Initial Bus Data Setup.)

NO.	TITLE	INITIAL REFERENCE DATA	INITIAL SETUP DATA	RANGE OF DATA	FUNCTION
01	HFR	7	7	0~63	Horizontal Frequency
02	C16	244	244	0~255	16:9 Mode Contrast Offset
03	VPO	0	0	0~63	Vertical Position
04	VS	29	17*	0~63	Vertical Size
05	VLN	6	8*	0~15	Vertical Linearity
06	VSC	0	2*	0~15	Vertical S Correction
07	HP	20	24*	0~63	Horizontal Position
08	EWD	29	34*	0~63	Horizontal Width
09	EWA	43	35*	0~63	Pin Amp
10	EWP	29	34*	0~63	Up Corner Pin
11	EWB	37	37	0~63	Bottom Corner Pin
12	BOW	10	7*	0~15	AFC Bow
13	ANG	9	8*	0~15	AFC Angle
14	UVL	2	0*	0~15	Upper Vertical Linearity
15	LVL	1	0*	0~15	Lower Vertical Linearity
16	EWT	8	4*	0~15	Pin Phase
17	VC	6	5*	0~15	Vertical Compression
18	RD	31	31	0~63	Red Drive
19	GD	31	31	0~63	Green Drive
20	BD	31	31	0~63	Blue Drive
21	RB	13	6*	0~15	Red Cutoff
22	GB	2	0*	0~15	Green Cutoff
23	BB	8	0*	0~15	Blue Cutoff
24	FLS	3	3	0~3	Filter System
25	SCN	11	11	0~15	Sub Contrast
26	STI	7	15*	0~15	Sub Tint
27	SCO	7	9*	0~15	Sub Color
28	SB	7	12*	0~31	Sub Bright
29	SSH	0	2*	0~255	Sub Sharpness
30	AFC	0	0	0~3	AFC Gain (Except TV Mode)
31	REF	0	0	0, 1	Reference Pulse Position
32	CDM	3	3	0~3	CD Mode Select
33	DCO	1	0*	0, 1	Dynamic Color Switch
34	ABL	1	1	0, 1	ABL Mode Switch
35	BAT	1	1	0, 1	ABL Level Switch 4:3 Mode
36	B16	1	1	0, 1	ABL Level Switch 16:9 Mode
37	CTP	1	1	0, 1	Chroma Trap Off Switch
38	CBP	0	0	0, 7	Chroma Bandpass Filter Switch
39	DCR	2	3*	0~3	DC Transmission select Switch
40	YGM	1	2*	0~3	Gamma Correction Select
41	POS	1	1	0, 1	Preshoot/Overshoot Switch
42	WP	0	0	0~3	RGB Limit Level
43	VM	3	3	0~3	Velocity Modulation
44	GYA	0	0	0, 1	G-Y Angle
45	CRS	0	0	0, 1	Aging Mode
46	HMA	1	1	0, 1	H Mask On/Off
47	HBS	1	1	0, 1	Horizontal Blanking Switch

SERVICE ADJUSTMENTS (Cont.)

Table 1. ON-SCREEN SERVICE MENU (Continued)

NO.	TITLE	INITIAL REFERENCE DATA	INITIAL SETUP DATA	RANGE OF DATA	FUNCTION
48	VBL	0	0	0~3	Vertical Blanking
49	WVB	0	0	0, 1	WV Blanking Select
50	HBL	15	15	0~15	Horizontal Blanking Left
51	HBR	5	0*	0~15	Horizontal Blanking Right
52	AFR	0	0	0~3	AFC Gain (TV Mode)
53	RHS	0	0	0, 1	Horizontal Sync Slice Level for RF
54	RVS	0	0	0, 1	Vertical Sync Slice Level for RF
55	EHS	0	0	0, 1	Horizontal Sync Slice Level for AV
56	EVV	1	1	0, 1	Vertical Sync Slice Level for AV
57	CDR	3	3	0~3	CD Mode (TV)
58	BGP	1	1	0, 1	BGP Switch
59	FSC	1	1	0, 1	FSC Switch
60	OPT	0	32*	0~255	Option 1 (See Note 1 page 6)
61	OP2	2	82*	0~255	Option 2 (See Note 2 page 6)
62	HR	23	34*	0~63	OSD Horizontal Position
63	SCA	0	2*	0~255	Color Offset (‘00’ In Adjust)
64	STA	0	254*	0~255	Tint Offset (‘00’ In Adjust)
65	SUB	–-	–	–	Not Used
66	SBC	11	11	0~15	Sub Contrast
67	SBT	15	5*	0~15	Sub Tint for Adjustment
68	SBL	15	12*	0~31	Sub Color for Adjustment
69	RCN	0	0	0~255	Contrast Offset for RF
70	RTN	253	0*	0~255	Tint Offset for RF
71	RCL	2	0*	0~255	Color Offset for RF
72	RBR	0	0	0~255	Bright Offset for RF
73	RSP	0	0	0~255	Sharpness Offset for RF
74	PPR	0	1*	0, 1	Pre/Overshoot Ratio for RF
75	SSF	3	3	0~3	Sharpness FO for S Input
76	AKB	48	48	0~255	AKB Timer
77	VMT	72	72	0~255	Video Mute Timer
78	DCN	249	249	0~255	Contrast Offset for YUV
79	DTN	254	4*	0~255	Tint Offset for YUV
80	DCL	10	16*	0~255	Color Offset for YUV
81	DBR	0	0	0~255	Bright Offset for YUV
82	DSP	0	0	0~255	Sharpness Offset for YUV
83	DVM	0	0	0~255	Velocity Offset for YUV
84	CBO	7	7	0~15	Cb Offset for YUV
85	CRO	7	7	0~15	Cr Offset for YUV
86	DRD	0	0	0~255	Red Drive Offset for YUV
87	DGD	0	0	0~255	Green Drive Offset for YUV
88	DBD	0	0	0~255	Blue Drive Offset for YUV
89	DRC	0	0	0~255	Red Cutoff Offset for YUV
90	DGC	0	0	0~255	Green Cutoff Offset for YUV
91	DBC	0	0	0~2557	Blue Cutoff Offset for YUV
92	EVB	3	2*	0~3	Vertical Blanking Width Top for 16:9
93	EWV	0	0	0, 1	Vertical Blanking Width Bottom for 16:9

NO.	TITLE	INITIAL REFERENCE DATA	INITIAL SETUP DATA	RANGE OF DATA	FUNCTION
94	EVS	0	0	0~255	Vertical Position Offset for 16:9
95	EVA	14	22*	0~255	Vertical Size Offset for 16:9
96	ERE	0	0	0, 1	Reference Pulse Position for 16:9
97	SED	254	255*	0~255	Horizontal Width Offset for 16:9
98	SEA	254	255*	0~255	Pin Offset for 16:9
99	SET	255	255	0~255	Pin Phase Offset for 16:9
100	DHS	0	0	0~255	Horizontal Width Offset for YUV
101	DHC	0	0	0~255	Horizontal Center Offset for YUV
102	EDC	0	0	0, 1	EW DC On/Off
103	VAP	32	26*	0~63	V Aspect
104	VSR	17	31*	0~63	V Scroll
105	ATT	10	6*	0~15	MTS Input Level
106	WDB	32	31*	0~63	MTS Low Separation
107	SPC	32	21*	0~63	MTS Hi Separation
108	SBO	0	0	0~255	Sub Bright Detector Voltage Offset
109	PCO	90	40*	0~127	PIP Chroma Gain
110	PTI	42	40*	0~63	PIP Tint
111	PUV	24	26*	0~255	PIP Top Location
112	PDV	147	147	0~255	PIP Bottom Location
113	PLH	15	13*	0~255	PIP Left Location
114	PRH	101	105*	0~255	PIP Right Location
115	PCN	67	43*	0~127	PIP Y Signal Gain
116	PBS	15	15	0~63	PIP BGP Phase for VCXO
117	–	–	–	–	Not Used
118	DRV	31	31	0~63	Red Drive Adjustment (See Grayscale Adjustment)
		31	31	0~63	Blue Drive Adjustment (See Grayscale Adjustment)
119	–	–	–	–	Screen Adjust (See Grayscale Adjustment)

PROGRAM CODES

The microprossesor used in this model is a multi-purpose type and is used in several different models. To ensure proper operation and the correct features for your particular model, the program codes must be correct.

Note 1. Option Data 1 (NO. 60 OPT) should be decimal 32 (00100000 binary). See page 4 INITIAL DATA SETUP, step 28, for set up procedure. If this program code is wrong the TV will not operate properly.

BIT	FUNCTION	DATA	
		0	1
0 ~1	NOT USED	—	—
2	SCAN VELOCITY	NONE	YES
3	CLOCK	NONE	YES
4	NOT USED	—	—
5	WIDE MODE	NONE	YES
6	SURROUND	NONE	YES
7	NOT USED	—	—

Note 2. Option Data 2 (NO. 61 OP2) should be decimal 82 (01010010 binary). See page 4 INITIAL DATA SETUP, step 29, for set up procedure. If this program code is wrong the TV will not operate properly.

BIT	FUNCTION	DATA	
		0	1
0	SHIPPING CONDITION OF COLOR ENHANCER	NORMAL	COOL
1	COLOR ENHANCER	NONE	YES
2	INITIAL CH & XDS	NONE	YES
3	FIXED/VARIABLE	FIXED	FIX/VAR
4	PIP	NONE	YES
5	AV INPUTS	AV1/2	AV1/2/3
6	BASS & TREBLE / TONE	BASS & TR	TONE
7	V-GUIDE	NONE	YES

SERVICE ADJUSTMENTS (Continued)

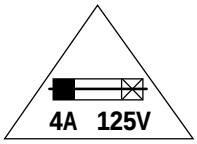
ANTENNA CONNECTIONS

This receiver is designed for UHF/VHF reception. A 75 ohm terminal is provided for UHF and VHF receptions. When connecting a CATV antenna system, connect the 75 ohm coaxial cable directly to the 75 ohm terminal. For 300 ohm VHF antenna, use an adapter (not included with the TV set).

CIRCUIT PROTECTION

Fuse F601 (4A) is included in the AC line. This fuse must be replaced with the proper fuse (see Parts List).

CAUTION



FOR CONTINUED PROTECTION AGAINST A RISK OF FIRE, REPLACE ONLY WITH THE SAME TYPE 4A, 125V FUSE.

ATTENTION : POUR MAINTENIR LA PROTECTION CONTRE LES RISQUES D' INCENDIE UTILISER UN FUSIBLE DE RECHANGE DE MEME TYPE 4A, 125V.

+B VOLTAGE CHECK

Connect Voltmeter + lead to TJ1 130V and – lead to ground (TE7). Connect receiver to AC 120V line. Tune receiver to an active channel. Reset the picture controls to the FACTORY PRESET levels (press remote control RESET key twice). Voltage must measure between +128.0V and +132.0V. If the voltage is out of this range, the power circuit must be checked. No +B adjustment is provided on this chassis.

HORIZONTAL WIDTH ADJUSTMENT

1. Tune receiver to an active channel.
2. Check the picture for proper width. If width is not correct, perform steps 3 ~ 6.
3. Turn off the receiver and disconnect the AC power cord (120V AC line).
4. While pressing the MENU key, reconnect the AC power cord. The Service Menu display will now appear.
5. Select NO. 08 EWD (Horizontal Width) with ▲ or ▼ key.
6. Adjust the data with + or – key for proper width. To turn off the Service Menu display, press the MENU key.

HORIZONTAL CENTERING ADJUSTMENT

1. Tune receiver to an active channel.
2. Check that picture is in the horizontal center of TV screen. If picture is not centered horizontally, perform steps 3 ~ 6.
3. Turn off the receiver and disconnect the AC power cord.
4. While pressing the MENU key, reconnect the AC power cord. The Service Menu display will now appear.
5. Select NO. 07 HP (Horizontal Position) with ▲ or ▼ key.
6. Adjust the data with + or – key for horizontal center. To turn off the Service Menu display, press the MENU key.

VERTICAL SIZE ADJUSTMENT

1. Tune receiver to an active channel.
2. Check the vertical size of the picture. If the vertical size is too large or small, perform steps 3 ~ 6.
3. Turn off the receiver and disconnect the AC power cord.
4. While pressing the MENU key, reconnect the AC power cord. The Service Menu display will now appear.
5. Select NO. 04 VS (Vertical Size) with ▲ or ▼ key.
6. Adjust the data with + or – key for full scan. To turn off the Service Menu display, press the MENU key.

VERTICAL CENTERING ADJUSTMENT

1. Tune receiver to an active channel.
2. Check that picture is in the center of TV screen. If picture center is too low, add resistor R513 (1K ohm 1W). If picture center is too high, change resistor R512 from 1K ohm 1/2W to a 470 ohm 1W.

GRAYSCALE ADJUSTMENT

1. Connect a color-bar generator to the antenna terminals.
2. Switch the generator to the white pattern.
3. Set the picture controls to the Sports level or Reset (use MENU key and ▲ or ▼ key or RESET key).
4. Turn off the receiver and disconnect the AC power cord (120V AC line).
5. While pressing the MENU key, reconnect the AC power cord. The Service Menu display will now appear.
6. Select NO. 18 RD (Red Drive), NO. 19 GD (Green Drive), and NO. 20 BD (Blue Drive) with ▲ or ▼ key and set each data to 31 with + or – key.
7. Select NO. 21 RB (Red Cutoff) with ▲ or ▼ key and set data to 6 with + or – key.
8. Select, NO. 22 GB (Green Cutoff), and NO. 23 BB (Blue Cutoff) with ▲ or ▼ key and set each data to 0 with + or – key.
9. Set NO. 28 SB (Sub Brightness) data to 12, NO. 29 SSH (Sub Sharpness) data to 2, NO. 33 DCO (Dynamic Color Switch) data to 0, and NO. 108 SBO (Sub Bright Offset) data to 0 with ▲ or ▼, and + or – keys.
10. Connect oscilloscope probe (at least 50:1) to TP47G and ground lead to TE47 on the CRT Socket PWB.
11. Select Service Menu NO. 119 with ▲ or ▼ key.
12. Adjust Screen Control (T402) to obtain 20 VP-P from black to white level. (See Figure 2.)

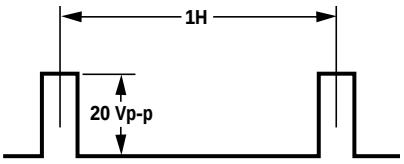


Figure 2.

13. Select the Service Menu NO. 118 DRV (Drive Adjustments) with ▲ or ▼ key.
14. Adjust Red and Blue Drive Levels alternately with 1, 3, 7, or 9 key to produce normal black and white picture in highlight areas. The Drive Level adjustment data will be written in the Service Menu No. 18 and 20 automatically. (See Figure 3.)

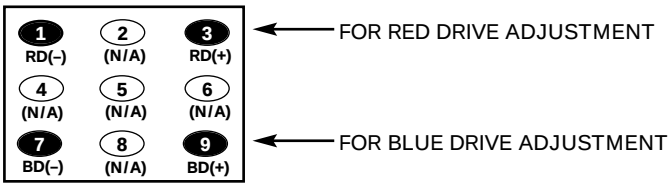


Figure 3. Remote Control Number keys' functions in Service Menu NO. 118 DRV

17. Check for proper grayscale at all brightness levels.

Note: If Grayscale Adjustment is made after picture tube replacement, check Brightness Level Adjustment.

BRIGHTNESS LEVEL ADJUSTMENT

Note: Grayscale Adjustment and High Voltage Check must be completed before attempting Brightness Level Adjustment.

1. Connect a color-bar generator to the antenna terminals.
2. Switch the generator to the crosshatch pattern.
3. Reset the picture controls to the Sports level.
4. Connect voltmeter (high impedance) + lead to terminal TP51 and – lead to terminal TP50 on main board. Set voltmeter for 1.5V ~ 3V range.
5. Turn off the receiver and disconnect the AC power cord.
6. While pressing the MENU key, reconnect the AC power cord. The Service Menu display will now appear.
7. Select NO. 28 SB (Sub Brightness) with ▲ or ▼ key.
8. Adjust the data with + or – key for 890 mVDC.
9. Press the MENU key to turn off the Service Menu display.
10. Check brightness level on every active channel, readjust (repeat steps 5 ~ 9), if necessary.

Note: Do not set to excessive brightness level, otherwise the contrast level will be suppressed.

HIGH VOLTAGE HOLD-DOWN TEST

Every time the receiver is serviced, the HIGH VOLTAGE HOLD-DOWN circuit must be tested for proper operation by following these steps:

1. Connect receiver to 120V AC line. Tune receiver to active channel. Reset the picture controls to the Sports level.
2. Check that the voltage measured between TP7 and TE7 (ground side) is within 16.5 VDC to 21 VDC. If the voltage is out of this range, the Hold-Down Circuit must be checked.
3. Connect a DC Voltage supply to TP7 and TE7 through a 100 ohm 1/4W resistor. Adjust the DC voltage to 23 VDC. The receiver should shutdown, losing raster and sound. Then the receiver should turn off automatically. This reaction indicates that the Hold-Down circuit is functioning properly. If the receiver does not shutdown, a malfunction is indicated and its cause **must** be found and corrected.
4. To obtain picture again, remove the DC Supply and wait a few minutes. Now turn on the receiver.

HIGH VOLTAGE CHECK

Note: +B (+130V) Voltage Check and Grayscale Adjustment must be completed before attempting High Voltage Check.

1. Connect high voltage voltmeter – lead to ground, and connect + lead to anode of picture tube.
2. Tune receiver to an active channel and confirm TV is operating properly.
3. Eliminate the beam current by adjusting the contrast and brightness controls to minimum.
4. Confirm high voltage is within 27.8 KV and 32.0 KV. If reading is not within range, check horizontal circuit.

No high-voltage adjustment is provided on this chassis.

FOCUS ADJUSTMENT

Adjust focus control (T402) for well defined scanning lines.

MULTI-SOUND SECTION ADJUSTMENTS

Note: Multi-Sound Section must be adjusted after A101 (U/V Tuner), IC3401 (MTS Decoder), or IC802 (EEPROM) is replaced.

INPUT LEVEL ADJUSTMENT

1. Connect a signal to the antenna terminals with audio of 1 KHz 100% modulation.
2. Turn off the receiver and disconnect the AC power cord (AC 120V line).
3. Connect voltmeter (RMS) to TP317 and ground.
4. While pressing the Menu key, reconnect the AC power cord. The Service Menu will now appear.
5. Select NO. 105 ATT (MTS Input Level) with the ▲ or ▼ key.
6. Adjust the + or – key for a voltmeter reading of 400 ± 20 mVrms at TP317.

SEPARATION ADJUSTMENT

7. Turn off the receiver and disconnect the AC power cord (AC 120V line).
8. Connect oscilloscope CH1 to TP317 and CH2 to TP318 and ground.
9. Connect an MTS TV/Stereo generator to antenna terminal.
10. While pressing the Menu key, reconnect the AC power cord. The Service Menu will now appear.
11. Select pilot, 300Hz audio frequency and Left modulating signal.
12. Select NO. 106 WDB (Wideband) with the ▲ or ▼ key.
13. Adjust the + or – key for minimum low frequencies at TP317. (See Figure 4.)
14. Select 4 KHz audio frequency and Right modulating signal.
15. Select NO. 107 SPC (Spectral) with the ▲ or ▼ key.
16. Adjust the + or – key for minimum high frequencies at TP318. (See Figure 4.)

Repeat adjustments (steps 11–16) until no further decreases in amplitude can be obtained. Press the MENU key to turn off the Service Menu display.

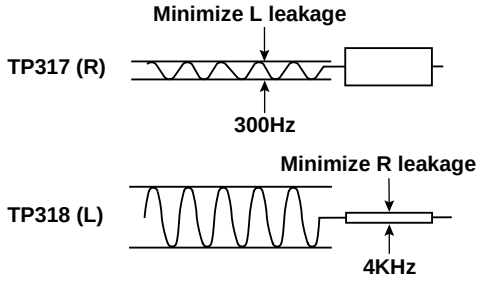


Figure 4. Separation Adjustments

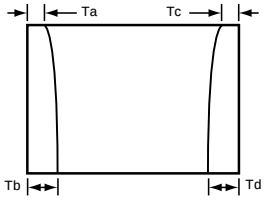
PURITY AND CONVERGENCE ADJUSTMENTS

Purity and Convergence have been aligned at the factory. No re-alignment is necessary.

SERVICE ADJUSTMENTS (Continued)

PINCUSHION CORRECTION ADJUSTMENT

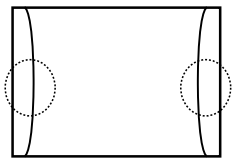
1. Connect a color-bar generator to the antenna terminals and select a crosshatch pattern.
2. Set the picture controls to the Sports level.
3. Turn off the receiver and disconnect the AC power cord (AC 120V line).
4. While pressing the Menu key, reconnect the AC power cord. The Service Menu will now appear.
5. Select No. 16 EWT with ▲ or ▼ key and adjust with + or – key for equal tilt at top and bottom.



Adjust No. 16 EWT for equal tilt: Ta=Tb, Tc=Td.

Figure 5.

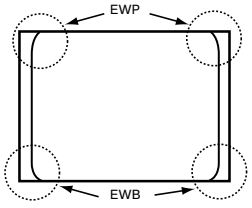
6. Select No. 09 EWA with ▲ or ▼ key and adjust with + or – key for straight vertical lines at the center.



Adjust No. 09 EWA for the center part of the vertical line to be straight.

Figure 6.

7. Select No. 10 EWP with ▲ or ▼ key and adjust with + or – key for straight vertical lines at the top.
8. Select No. 11 EWB with ▲ or ▼ key and adjust with + or – key for straight vertical lines at the bottom.



Adjust No. 10 EWP for straight vertical lines at the top.
Adjust No. 11 EWB for straight vertical lines at the bottom.

Figure 7.

9. Repeat steps 5 through 8 for best pincushion adjustment.
10. Press the MENU key to turn off the Service Menu display.

SERVICE HINTS

POWER FAILURE DETECTOR

This unit is equipped with a Power Failure Detector function included in the CPU which checks for an abnormal condition in the chassis power supplies, including the power supply derived from the Horizontal Output Transformer.

If, while the power is on, a failure is caused by any of the following that results in a low voltage supply, the CPU will turn the unit off in 1.5 seconds to prevent unnecessary damage:

- Failure within the power supply circuits.
- A short circuit in the load side from the supply.
- Stoppage of the Horizontal Output Oscillator caused by the X-Radiation protection Hold-Down Circuit.

If, while the power is off, the power is switched on and any of these failures remains uncorrected, the CPU will shut off the power within 3 seconds.

Check the following if the unit is turned off by the power failure detector.

1. Disconnect the AC power cord (120V AC line) for at least 10 seconds.
2. Connect a DC Voltmeter to the following TEST POINTS.

TJ4	**26V**
TJ6	**5V**
D429 Cathode	**8V**

3. Press the Power key and check for the proper voltage supplies.
4. If any of these voltages is low, the power failure detector should turn the unit off within 3 seconds.
5. Check all circuits listed above.

Note: This unit is equipped with a Power Surge Protection feature included in the CPU. If power failure occurs three times within 15 minutes, the CPU will automatically stop functioning to help prevent secondary damage. (TV will not turn on by pressing the power key.) To reset the operating programs within the CPU, disconnect the AC power cord for at least 10 seconds.

MECHANICAL DISASSEMBLIES

CABINET BACK REMOVAL

1. Refer to Figure 1, remove 11 screws.
2. Pull off cabinet back and remove.

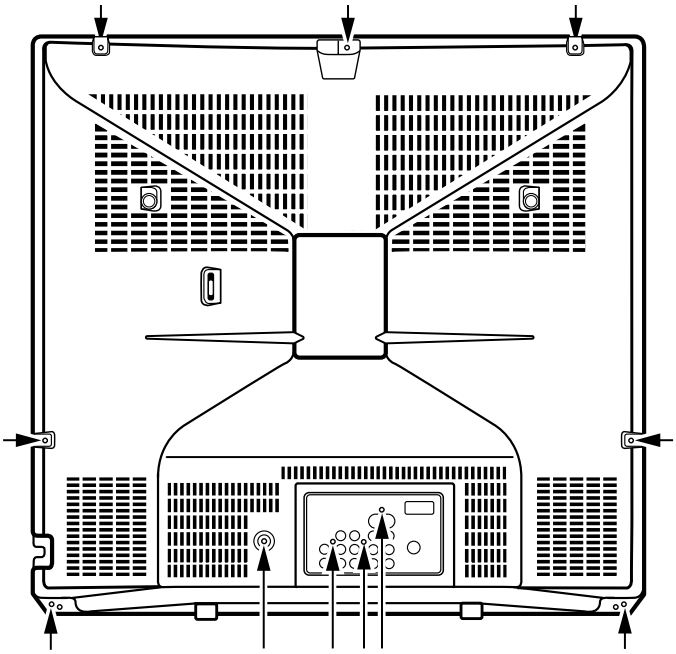


Figure 1. Cabinet Back Removal

CHASSIS REMOVAL

1. Remove cabinet back.
2. Discharge the picture tube anode (2nd anode lead) to the dag coating (picture tube grounding lead).
3. Disconnect degaussing coil socket (KD), picture tube socket, deflection yoke connector (KX), speakers connector (KSP), picture tube ground lead, and 2nd anode lead.
4. Remove chassis completely by sliding it straight back.

PICTURE TUBE REMOVAL

CAUTION: Do not disturb the deflection yoke or magnet assembly on the picture tube neck. Care must be taken to keep these assemblies intact, unless picture tube is being replaced. Discharge the picture tube to the coating before handling the tube.

1. Remove chassis, referring to Chassis Removal instructions.
2. Place cabinet's front face down on a soft surface.
3. Remove the screw on each corner of the picture tube and GENTLY lift the picture tube out of the cabinet.
4. Install a replacement picture tube in reverse order. Properly install the degaussing coil and picture tube grounding lead on the picture tube. See Figure 2.

Note: If Picture Tube is being replaced, mount the Degaussing Coil properly on the tube. See Figure 2.

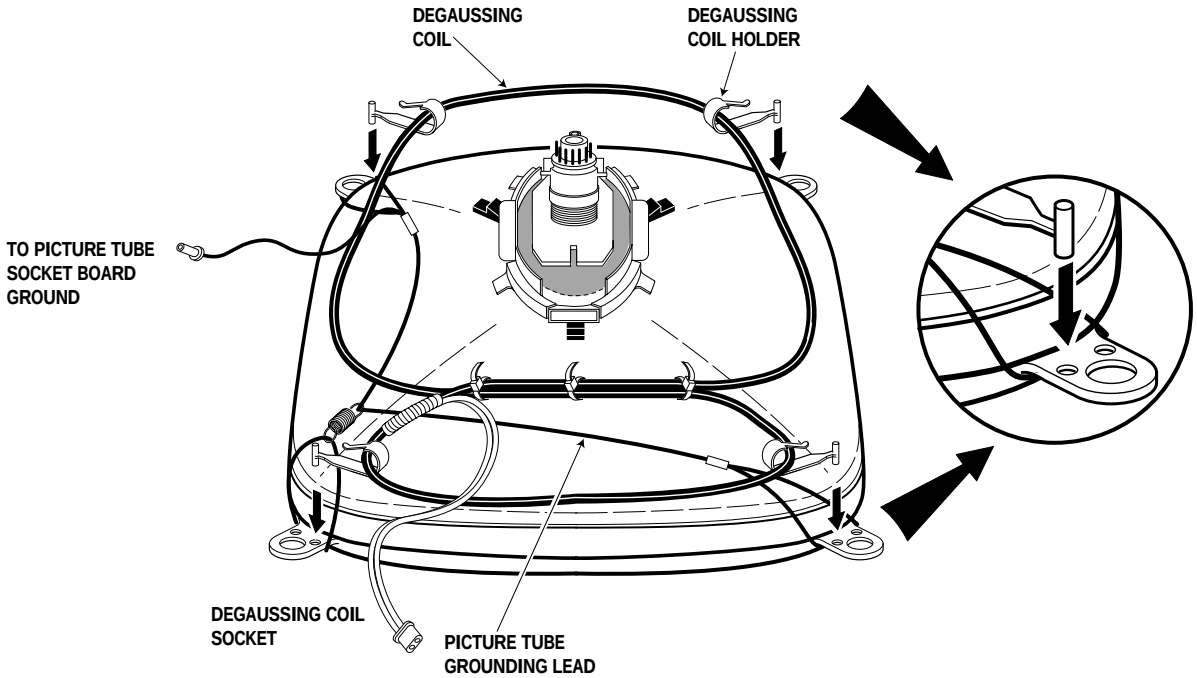


Figure 2. Picture Tube Removal

CHASSIS ELECTRICAL PARTS LIST

CAUTION: To Protect against electrical shock and for continued product safety, refer to SAFETY PRECAUTIONS, X-RADIATION PRECAUTIONS, HIGH VOLTAGE HOLD-DOWN TEST, and PRODUCT SAFETY NOTICE on Page 2.

PRODUCT SAFETY NOTICE

PRODUCT SAFETY SHOULD BE CONSIDERED WHEN A REPLACEMENT IS MADE IN ANY AREA OF A RECEIVER. COMPONENTS INDICATED BY A STAR (★) IN THIS PARTS LIST AND THE SCHEMATIC DIAGRAM DESIGNATE COMPONENTS IN WHICH SAFETY CAN BE OF SPECIAL SIGNIFICANCE. IT IS PARTICULARLY RECOMMENDED THAT ONLY PARTS DESIGNATED ON THE FOLLOWING PARTS LIST BE USED FOR COMPONENT REPLACEMENT DESIGNATED BY A STAR. NO DEVIATIONS FROM RESISTANCE, WATTAGE, AND VOLTAGE RATINGS MAY BE MADE FOR REPLACEMENT ITEMS DESIGNATED BY A STAR.

Notes: Parts having Location Number are located on the following boards.
- Numbers 300, 1000, 3400 Series . . . . . .On the AV Board and Main Board
- Numbers 700 Series . . . . . .On the Picture Tube Socket Board.
- Numbers 900 Series . . . . . .Out of Board.
- All Other Numbers . . . . . .On the Main Board

Note: Schematic part location numbers may not always match with the part descriptions. The part descriptions are correct and should be used.

Schematic Location	Part No.	Description

CAPACITORS

NOTES:
Read description of the Capacitor as follows:

(Example)

CERAMIC 100P K 50V

- 50V — Rated Voltage
- K — Tolerance Symbols:

  less than 10PF
  - A . .Not specified
  - B . .±0.1PF
  - C . .±0.25PF
  - D . .±0.5PF
  - F . .±1PF
  - G . .±2PF
  - R . .+0.25 - 0PF
  - S . .+0 - 0.25PF
  - E . .+0 - 1PF

  more than 10PF
  - A . .Not specified
  - B . .±0.1%
  - C . .±0.25%
  - D . .±0.5%
  - F . .±1%
  - G . .±2%
  - H . .±3%
  - J . .±5%
  - K . .±10%
  - L . .±15%
  - M . .±20%
  - N . .±30%
  - P . .+100 - 0%
  - Q . .+30 - 10%
  - T . .+50 - 10%
  - U . .+75 - 10%
  - V . .+20 - 10%
  - W .+100 - 10%
  - X . .+40 - 20%
  - Y . .+150 - 10%
  - Z . .+80 - 20%
- 100P — Rated Value: P...Pico Farad U...Micro Farad
- CERAMIC — Material:
  - CERAMIC . . . . . .Ceramic
  - MT-PAPER . . . . .Metalized Paper
  - POLYESTER . . .Polyester
  - MT-POLYEST . .Metalized Polyester
  - POLYPRO . . . . .Polypropylene
  - MT-POLYPRO . .Metalized Polypropylene
  - COMPO-FILM . .Composite Film
  - MT-COMPO . . . .Metalized Composite
  - STYRENE . . . . . .Styrene
  - TA-SOLID . . . . .Tantalum Solid
  - AL-SOLID . . . . . .Aluminum Solid
  - ELECT . . . . . .Electrolytic
  - NP-ELECT . . . . .Non-Polarized Electrolytic
  - OS-SOLID . . . . .Aluminum Solid with Organic Semiconductive Electrolytic

Schematic Location	Part No.	Description		
C001	404 084 3801	ELECT	1U M	50V
C002	404 084 3801	ELECT	1U M	50V
C003	403 224 6009	CERAMIC	4700P K	50V
C004	403 224 6009	CERAMIC	4700P K	50V
C010	404 084 3009	ELECT	220U M	16V
C011	404 084 3009	ELECT	220U M	16V
C015	404 084 3306	ELECT	470U M	16V
C101	404 084 2408	ELECT	470U M	6.3V
C103	403 224 6108	CERAMIC	0.01U K	50V
C104	403 357 9601	CERAMIC	0.1U Z	50V
C107	403 224 6108	CERAMIC	0.01U K	50V
C112	404 084 3207	ELECT	47U M	16V
C113	403 357 9601	CERAMIC	0.1U Z	50V
C200	403 224 6108	CERAMIC	0.01U K	50V
C202	403 235 4902	CERAMIC	470P K	50V
C203	404 084 5706	MT-POLYEST	0.47UJ	63V
C205	404 084 6901	NP-ELECT	1U M	50V
C206	403 357 9601	CERAMIC	0.1U Z	50V
C207	403 345 9606	CERAMIC	0.47U K	10V
C208	403 345 9606	CERAMIC	0.47U K	10V
C209	403 296 0004	CERAMIC	0.1U K	25V
C210	403 296 0004	CERAMIC	0.1U K	25V
C211	403 224 6108	CERAMIC	0.01U K	50V
C212	403 224 6108	CERAMIC	0.01U K	50V
C213	403 224 6108	CERAMIC	0.01U K	50V
C214	403 357 9601	CERAMIC	0.1U Z	50V
C215	404 084 4204	ELECT	4.7U M	50V
C216	403 296 0004	CERAMIC	0.1U K	25V
C217	404 084 6901	NP-ELECT	1U M	50V
C218	403 235 4605	CERAMIC	270P K	50V
C219	403 224 5705	CERAMIC	1000P K	50V
C220	404 084 3702	ELECT 0	.47U M	50V
C221	404 084 4204	ELECT	4.7U M	50V

Schematic Location	Part No.	Description		
C222	404 084 4204	ELECT	4.7U M	50V
C223	404 085 4302	ELECT	4700U M	10V
C236	403 357 9601	CERAMIC	0.1U Z	50V
C245	403 224 5507	CERAMIC	22P J	50V
C246	403 235 0607	CERAMIC	100P J	50V
C247	403 235 0607	CERAMIC	100P J	50V
C251	403 234 9601	CERAMIC	15P J	50V
C253	403 224 6108	CERAMIC	0.01U K	50V
C271	404 087 0500	ELECT	220U M	10V
C301	403 041 8804	ELECT	10U M	16V
C302	403 041 8804	ELECT	10U M	16V
C303	403 357 9601	CERAMIC	0.1U Z	50V
C306	403 357 9601	CERAMIC	0.1U Z	50V
C307	403 042 2405	ELECT	100U M	16V
C308	403 319 4804	CERAMIC	0.22U Z	16V
C309	403 357 9304	CERAMIC	560P J	50V
C311	403 043 9106	ELECT	47U M	16V
C312	403 357 9601	CERAMIC	0.1U Z	50V
C313	403 357 9601	CERAMIC	0.1U Z	50V
C314	403 357 9601	CERAMIC	0.1U Z	50V
C316	403 357 9601	CERAMIC	0.1U Z	50V
C317	403 357 9601	CERAMIC	0.1U Z	50V
C322	403 357 9601	CERAMIC	0.1U Z	50V
C323	403 357 9601	CERAMIC	0.1U Z	50V
C333	401 150 6001	MT-GLAZE	0.000 ZA	1/10W
C351	403 224 6108	CERAMIC	0.01U K	50V
C352	404 085 4906	ELECT	2200U M	10V
C355	403 224 5606	CERAMIC	2700P K	50V
C356	404 084 6901	NP-ELECT	1U M	50V
C358	403 224 6108	CERAMIC	0.01U K	50V
C359	404 084 6901	NP-ELECT	1U M	50V
C363	403 258 9304	NP-ELECT	10U M	25V
C369	403 235 5305	CERAMIC	1200P K	50V
C381	403 076 3607	CERAMIC	470P K	500V
C382	403 357 9601	CERAMIC	0.1U Z	50V
C384	403 224 6108	CERAMIC	0.01U K	50V
C385	403 224 6108	CERAMIC	0.01U K	50V
C405	404 084 3702	ELECT 0	.47U M	50V
★ C406	403 076 3607	CERAMIC	470P K	500V
★ C407	403 076 0507	CERAMIC	2200P K	500V
C408	403 103 0005	ELECT	4.7U M	160V
★ C411	403 343 8205	MT-POLYPRO	7800P H 1	.5KV
	404 077 4600	MT-POLYPRO	7800P H	1.5K
★ C412	403 343 8205	MT-POLYPRO	7800P H 1	.5KV
	404 077 4600	MT-POLYPRO	7800P H	1.5K
★ C413	403 083 4307	POLYPRO	0.022U J	400V
★ C414	403 083 3409	POLYPRO	0.015U J	400V
★ C416	403 346 7126	MT-POLYPRO	0.27U J	250V
	403 372 6807	MT-POLYPRO	0.27U J	250V
★ C417	403 379 0303	MT-POLYPRO	0.24U J	250V
	403 346 7027	MT-POLYPRO	0.24U J	250V
	403 372 6708	MT-POLYPRO	0.24U J	250V
★ C419	403 158 9107	MT-POLYEST	2.2U K	100V
C421	404 087 0500	ELECT	220U M	10V

Schematic Location	Part No.	Description		
C422	403 066 6106	MT-POLYEST	0.47U J	250V
C434	403 087 1302	NP-ELECT	0.47U M	160V
★ C436	403 324 3106	CERAMIC	820P K	3K
★ C437	403 076 4000	CERAMIC	4700P K	500V
C461	403 074 8901	CERAMIC	680P K	50V
C462	403 224 6108	CERAMIC	0.01U K	50V
C463	404 086 5704	POLYESTER	2200P K	63V
C466	404 084 4204	ELECT	4.7U M	50V
C482	404 084 4709	ELECT	47U M 1	00V
C484	404 084 4204	ELECT	4.7U M	50V
★ C486	403 076 3607	CERAMIC	470P K	500V
C487	404 087 3402	ELECT	1000U M	35V
C493	404 056 5307	NP-ELECT	2.2U M	100V
C497	404 084 2200	ELECT	100U M 6	.3V
C502	403 053 2104	ELECT	220U M	35V
C503	403 204 1802	ELECT	3.3U K	50V
C504	403 045 9807	ELECT	2200U M	25V
C506	404 084 5201	POLYESTER	0.018UK	63V
★ C511	403 058 5407	POLYESTER	0.15U K	50V
	403 141 5802	POLYESTER	0.15U J	50V
	403 274 9302	POLYESTER	0.15U J	50V
	403 274 9401	POLYESTER	0.15U K	50V
C516	404 084 4204	ELECT	4.7U M	50V
★ C601	404 066 2204	MT-POLYEST	0.22U M	275V
	404 071 2404	MT-POLYEST	0.22U M	250V
	404 089 1703	MT-POLYEST	0.22U M	275V
★ C602	403 075 7101	CERAMIC	1000P K	500V
★ C603	403 075 7101	CERAMIC	1000P K	500V
★ C604	403 075 7101	CERAMIC	1000P K	500V
★ C606	404 088 2909	CERAMIC	1000P M	250V
	404 088 7102	CERAMIC	1000P M	250V
★ C608	403 271 9701	CERAMIC	3300P K	1K
★ C609	404 075 5005	ELECT	470U M	200V
	404 089 3509	ELECT	470U M	200V
C612	404 089 6302	MT-POLYEST	0.18U J	63V
C613	404 086 5209	POLYESTER	0.012U J	63V
C620	404 086 5100	POLYESTER	0.1U J	63V
C622	404 084 3306	ELECT	470U M	16V
★ C625	403 266 5008	CERAMIC	2700P K	1K
C626	403 043 1902	ELECT	2200U M	16V
C628A	404 037 0703	ELECT	470U M	160V
C629	404 084 3009	ELECT	220U M	16V
C630	404 084 3801	ELECT	1U M	50V
★ C631	404 088 2909	CERAMIC	1000P M	250V
	404 088 7102	CERAMIC	1000P M	250V
★ C632	404 088 3005	CERAMIC	2200P M	250V
	404 088 7201	CERAMIC	2200P M	250V
C634	404 084 3207	ELECT	47U M	16V
C636	403 224 6108	CERAMIC	0.01U K	50V
C683	404 084 3009	ELECT	220U M	16V
C688	404 084 2804	ELECT	100U M	16V
C689	403 357 9601	CERAMIC	0.1U Z	50V
C693	404 084 3801	ELECT	1U M	50V
C731	404 087 0500	ELECT	220U M	10V

Schematic Location	Part No.	Description		
C741	404 087 2801	ELECT	0.22 M	50V
★ C742	403 077 2807	CERAMIC	1000P Z	2K
C745	403 159 7409	MT-POLYEST	0.1U K	250V
C747	403 260 0900	ELECT	47U M	250V
C801	403 224 6108	CERAMIC	0.01U K	50V
C806	404 084 2705	ELECT	10U M	16V
C811	404 084 3801	ELECT	1U M	50V
C822	404 091 6406	ELECT	220U M	6.3V
C831	403 076 0200	CERAMIC	220P K	500V
C835	403 224 6108	CERAMIC	0.01U K	50V
C853	404 087 1200	ELECT	0.1U M	50V
C854	403 235 1000	CERAMIC	220P J	50V
C856	404 084 3801	ELECT	1U M	50V
C857	403 235 1000	CERAMIC	220P J	50V
C858	403 224 5705	CERAMIC	1000P K	50V
C861	403 235 0607	CERAMIC	100P J	50V
C1001	403 041 8804	ELECT	10U M	16V
C1002	403 042 7707	ELECT	22U M	16V
C1004	403 224 6108	CERAMIC	0.01U K	50V
C1005	403 224 6108	CERAMIC	0.01U K	50V
C1007	403 224 6108	CERAMIC	0.01U K	50V
C1011	403 224 6108	CERAMIC	0.01U K	50V
C1021	403 041 8804	ELECT	10U M	16V
C1026	403 041 8804	ELECT	10U M	16V
C1032	403 043 0202	ELECT	220U M	16V
C1051	403 042 7707	ELECT	22U M	16V
C1052	403 042 7707	ELECT	22U M	16V
C1053	403 042 7707	ELECT	22U M	16V
C1081	404 084 3306	ELECT	470U M	16V
C1091	403 224 6108	CERAMIC	0.01U K	50V
C1902	404 084 2705	ELECT	10U M	16V
C3401	404 087 1200	ELECT	0.1U M	50V
C3404	404 089 6500	NP-ELECT	4.7U M	50V
C3406	403 325 2504	CERAMIC	0.012U K	50V
C3407	403 235 5701	CERAMIC	5600P K	50V
C3408	404 084 3702	ELECT 0	.47U M	50V
C3411	404 084 3702	ELECT 0	.47U M	50V
C3412	404 084 3207	ELECT	47U M	16V
C3413	404 084 4204	ELECT	4.7U M	50V
C3414	404 084 2804	ELECT	100U M	16V
C3416	404 089 6500	NP-ELECT	4.7U M	50V
C3417	404 084 4204	ELECT	4.7U M	50V
C3418	404 089 6500	NP-ELECT	4.7U M	50V
C3421	403 224 5606	CERAMIC	2700P K	50V
C3422	403 323 3602	CERAMIC	0.047U K	50V
C3423	403 342 9203	TA-SOLID	3.3U K	10V
C3424	404 089 6500	NP-ELECT	4.7U M	50V
C3426	403 299 1820	TA-SOLID	10U K	10V
C3427	404 084 3801	ELECT	1U M	50V
C3431	403 224 6009	CERAMIC	4700P K	50V
C3432	404 087 1200	ELECT	0.1U M	50V
C3433	403 224 6009	CERAMIC	4700P K	50V
C3434	403 343 4603	CERAMIC	0.022U K	50V
C3435	404 084 4204	ELECT	4.7U M	50V

Schematic Location	Part No.	Description		
C3436	404 089 6500	NP-ELECT	4.7U M	50V
C3437	404 084 4204	ELECT	4.7U M	50V
C3439	404 089 6500	NP-ELECT	4.7U M	50V
C8002	404 084 3207	ELECT	47U M	16V
C8003	403 235 0409	CERAMIC	68P J	50V
C8011	403 235 0409	CERAMIC	68P J	50V
C8012	403 296 0004	CERAMIC	0.1U K	25V
C8014	403 323 3602	CERAMIC	0.047U K	50V
C8015	403 319 4804	CERAMIC	0.22U Z	16V
C8017	403 319 4804	CERAMIC	0.22U Z	16V
C8021	403 357 9601	CERAMIC	0.1U Z	50V
C8022	404 084 3207	ELECT	47U M	16V
C8023	403 357 9601	CERAMIC	0.1U Z	50V
C8024	404 084 3207	ELECT	47U M	16V
C8026	403 357 9601	CERAMIC	0.1U Z	50V
C8027	403 224 6108	CERAMIC	0.01U K	50V
C8028	403 224 6108	CERAMIC	0.01U K	50V
C8031	403 357 9601	CERAMIC	0.1U Z	50V
C8032	404 084 3207	ELECT	47U M	16V
C8033	403 357 9601	CERAMIC	0.1U Z	50V
C8034	403 224 6108	CERAMIC	0.01U K	50V
C8035	403 224 6108	CERAMIC	0.01U K	50V
C8036	404 084 2705	ELECT	10U M	16V
C8037	403 357 9601	CERAMIC	0.1U Z	50V
C8041	403 357 9601	CERAMIC	0.1U Z	50V
C8042	404 084 3207	ELECT	47U M	16V
C8051	403 235 0409	CERAMIC	68P J	50V
C8052	403 224 6108	CERAMIC	0.01U K	50V
C8053	403 235 0805	CERAMIC	150P J	50V
C8054	403 224 6108	CERAMIC	0.01U K	50V
C8055	403 357 9601	CERAMIC	0.1U Z	50V
C8056	403 357 9601	CERAMIC	0.1U Z	50V
C8057	403 357 9601	CERAMIC	0.1U Z	50V
C8058	403 224 6108	CERAMIC	0.01U K	50V
C8059	404 084 3207	ELECT	47U M	16V
C8060	403 296 0004	CERAMIC	0.1U K	25V
C8071	404 084 2705	ELECT	10U M	16V
C8072	404 084 2705	ELECT	10U M	16V
C8074	403 235 0607	CERAMIC	100P J	50V
C8076	403 235 0607	CERAMIC	100P J	50V
C8077	403 235 4902	CERAMIC	470P K	50V
C8081	404 084 3702	ELECT 0	.47U M	50V
C8082	403 224 5804	CERAMIC	2200P K	50V
C8091	403 224 6108	CERAMIC	0.01U K	50V
J1006TM	404 084 4204	ELECT	4.7U M	50V
J1007TM	404 084 4204	ELECT	4.7U M	50V
J1013TM	404 084 4204	ELECT	4.7U M	50V
J1014TM	404 084 4204	ELECT	4.7U M	50V

Schematic Location	Part No.	Description
	DIODES	
D101	408 047 6205	ZENER DIODE MTZJ36A (36V)
D205	407 108 5300	DIODE SB07-03N
D206	407 206 5608	ZENER DIODE UDZS10B (10V)
D207	407 206 5608	ZENER DIODE UDZS10B (10V)
D208	407 206 5608	ZENER DIODE UDZS10B (10V)
D210	407 108 5300	DIODE SB07-03N
D276	407 149 0807	DIODE 1SS355 TE-17
D277	407 149 0807	DIODE 1SS355 TE-17
D278	407 149 0807	DIODE 1SS355 TE-17
D279	407 149 0807	DIODE 1SS355 TE-17
D340	407 149 0807	DIODE 1SS355 TE-17
D351	407 206 5608	ZENER DIODE UDZS10B (10V)
D353	407 056 7906	ZENER DIODE RD5.1EB1 (5.1V)
	407 099 5006	ZENER DIODE MTZJ4.7A (4.7V)
D406	407 006 4108	DIODE ERB44-04
D407	407 095 8001	DIODE ERD07-15L
★ D421	407 158 1307	ZENER DIODE HZ11B2L (11V)
★ D422	407 158 1307	ZENER DIODE HZ11B2L (11V)
D428	408 047 4409	ZENER DIODE MTZJ15A (15V)
D429	407 013 4306	DIODE 1S2076A
	407 013 7109	DIODE 1S2473
	408 008 2406	DIODE 1N4148
D461	407 013 4207	DIODE 1S2076
	407 013 4306	DIODE 1S2076A
	407 078 2705	DIODE 1SS244
D471	407 013 4306	DIODE 1S2076A
	407 013 7109	DIODE 1S2473
	408 008 2406	DIODE 1N4148
D472	407 166 7605	ZENER DIODE MTZJ2.0B (2V)
D481	407 007 6606	DIODE ES1
	407 124 5506	DIODE RMPG06G
	407 124 6404	DIODE ERA18-04
D482	407 011 4407	DIODE TVR1G
D483	407 007 6606	DIODE ES1
	407 124 5506	DIODE RMPG06G
	407 124 6404	DIODE ERA18-04
D490	408 047 7707	ZENER DIODE MTZJ5.6C (5.6V)
D495	407 013 4306	DIODE 1S2076A
	407 013 7109	DIODE 1S2473
	408 008 2406	DIODE 1N4148
D501	407 005 8602	DIODE ERA15-02
	407 011 3004	DIODE S5277B
	407 088 6502	DIODE MPG06D
	408 009 9404	DIODE 1N4002ID
D502	407 118 2207	ZENER DIODE 1Z75 (75V)
D503	408 047 6205	ZENER DIODE MTZJ36A (36V)
D508	407 013 4306	DIODE 1S2076A
	407 013 7109	DIODE 1S2473
	408 008 2406	DIODE 1N4148
★ D601	407 124 9801	DIODE RBV-608
D609	407 007 6903	DIODE ES1Z
	407 124 5605	DIODE RMPG06D
	407 124 6503	DIODE ERA18-02
	408 009 9008	DIODE BYD33D
D610	407 013 4306	DIODE 1S2076A
	407 013 7109	DIODE 1S2473
	408 008 2406	DIODE 1N4148
D611	407 057 6304	ZENER DIODE RD7.5EB1 (7.5V)
	407 099 5808	ZENER DIODE MTZJ7.5A (7.5V)
★ D612	407 104 2402	PHOTO COUPLE PC817C
	407 106 6101	PHOTO COUPLE PC817D
	407 147 5705	PHOTO COUPLE ON3131S
	407 175 9904	PHOTO COUPLE TLP621-1-BL
D614	407 013 4306	DIODE 1S2076A
	407 013 7109	DIODE 1S2473
	408 008 2406	DIODE 1N4148
D621	407 007 7603	DIODE EU2
★ D624	407 129 6706	DIODE RU4YX LF-L1
	407 211 6102	DIODE FE301-1L43
★ D625A	407 191 3900	DIODE FML-G16S
D627	407 013 4306	DIODE 1S2076A
	407 013 7109	DIODE 1S2473
	408 008 2406	DIODE 1N4148
D629	407 054 7007	ZENER DIODE RD16EB1 (16V)
	407 099 7208	ZENER DIODE MTZJ16A (16V)
D680	407 013 4306	DIODE 1S2076A
	407 013 7109	DIODE 1S2473
	408 008 2406	DIODE 1N4148
D683	407 013 4306	DIODE 1S2076A
	407 013 7109	DIODE 1S2473
	408 008 2406	DIODE 1N4148
D687	407 013 4306	DIODE 1S2076A
	407 013 7109	DIODE 1S2473
	408 008 2406	DIODE 1N4148
D693	407 057 2702	ZENER DIODE RD6.2EB2 (6.2V)
	407 099 5402	ZENER DIODE MTZJ6.2B (6.2V)
D694	407 013 4306	DIODE 1S2076A
	407 013 7109	DIODE 1S2473
	408 008 2406	DIODE 1N4148
D702	407 006 3903	DIODE ERB43-04
	407 011 4407	DIODE TVR1G
D703	407 006 3903	DIODE ERB43-04
	407 011 4407	DIODE TVR1G
D704	407 006 3903	DIODE ERB43-04
	407 011 4407	DIODE TVR1G
D705	407 006 3903	DIODE ERB43-04
	407 011 4407	DIODE TVR1G
D712	407 006 3903	DIODE ERB43-04
	407 011 4407	DIODE TVR1G
D713	408 047 6502	ZENER DIODE MTZJ5.1A (5.1V)
D714	408 047 6502	ZENER DIODE MTZJ5.1A (5.1V)
D715	408 047 6502	ZENER DIODE MTZJ5.1A (5.1V)
D722	407 006 3903	DIODE ERB43-04
	407 011 4407	DIODE TVR1G
D732	407 057 8308	ZENER DIODE RD8.2EB2 (8.2V)
	407 063 9504	ZENER DIODE MTZJ8.2B (8.2V)

Schematic Location	Part No.	Description
D741	407 013 4306	DIODE 1S2076A
	407 013 7109	DIODE 1S2473
	408 008 2406	DIODE 1N4148
D751	407 118 2207	ZENER DIODE 1Z75 (75V)
D752	407 118 2207	ZENER DIODE 1Z75 (75V)
D753	407 118 2207	ZENER DIODE 1Z75 (75V)
D754	408 048 2404	ZENER DIODE MTZJ12B (12V)
D820	407 149 0807	DIODE 1SS355 TE-17
D831	407 222 5903	ZD UDZS-TE-173.6B (3.6V)
D1001	407 054 0008	ZENER DIODE RD10EB2 (10V)
	407 099 6102	ZENER DIODE MTZJ10B (10V)
D1002	407 054 0008	ZENER DIODE RD10EB2 (10V)
	407 099 6102	ZENER DIODE MTZJ10B (10V)
D1011	407 054 0008	ZENER DIODE RD10EB2 (10V)
	407 099 6102	ZENER DIODE MTZJ10B (10V)
D1021	407 054 0008	ZENER DIODE RD10EB2 (10V)
	407 099 6102	ZENER DIODE MTZJ10B (10V)
D1026	407 054 0008	ZENER DIODE RD10EB2 (10V)
	407 099 6102	ZENER DIODE MTZJ10B (10V)
D1051	407 054 0008	ZENER DIODE RD10EB2 (10V)
	407 099 6102	ZENER DIODE MTZJ10B (10V)
D1052	407 054 0008	ZENER DIODE RD10EB2 (10V)
	407 099 6102	ZENER DIODE MTZJ10B (10V)
D1053	407 054 0008	ZENER DIODE RD10EB2 (10V)
	407 099 6102	ZENER DIODE MTZJ10B (10V)
D1901	408 047 9206	ZENER DIODE MTZJ7.5C (7.5V)
D8000	407 099 4504	ZENER DIODE MTZJ3.9A (3.9V)

INTEGRATED CIRCUITS

IC002	409 275 7903	IC LA4525
★ IC201	409 496 1506	IC CXA2142BS
IC301	409 491 5608	IC TDA9183T/N1
IC486	409 366 7904	IC UPC78M09AHF
	409 367 2809	IC BA178M09T
	409 370 0007	IC MC78M09CT
	409 377 5401	IC L78M09CV
★ IC501P	409 492 9704	IC LA7847
★ IC601	409 172 8102	IC SE130NH
IC681	409 066 7303	IC UPC78L05J
	409 241 8309	IC TA78L05S
IC701	409 476 5104	IC TDA6108JF/N1
IC801	410 433 2609	IC M37272MA-***** T4
IC802	409 333 3700	IC 24LC02B/P
	409 376 1503	IC ST24C02B6
	409 440 8902	IC M24C02-BN6
	409 495 6908	IC CAT24WC02P
	409 497 0706	IC S524C20D21-DCB0
	409 528 8404	IC S524A40X21-DCB0
IC1001	409 051 3006	IC TC4053BP
IC1002	409 051 3006	IC TC4053BP
IC1003	409 051 3006	IC TC4053BP
IC3401	409 467 1108	IC CXA2134Q-T6
IC8001	409 466 6302	IC M65667SP

Schematic Location	Part No.	Description

COILS

★ LF601	645 042 7510	LINE FILTER
L101	645 008 2894	INDUCTOR, 5.6U K
	645 016 3104	INDUCTOR, 5.6U K
L223	645 011 0276	INDUCTOR, 2.7U K
	645 016 2800	INDUCTOR, 2.7U K
L242	645 003 9652	INDUCTOR, 10U J
L243	645 015 5000	INDUCTOR, 56U J
L301	645 008 2894	INDUCTOR, 5.6U K
	645 016 3104	INDUCTOR, 5.6U K
L302	645 008 2894	INDUCTOR, 5.6U K
	645 016 3104	INDUCTOR, 5.6U K
L303	645 008 2894	INDUCTOR, 5.6U K
	645 016 3104	INDUCTOR, 5.6U K
L306	645 008 2856	INDUCTOR, 39U K
	645 016 3012	INDUCTOR, 39U K
L401	645 036 4327	INDUCTOR, 1.0U, FILTER
L402	652 000 2180	CORE, PIPE
L403	610 078 6820	PIPE CORE
★ L413	645 029 8035	COIL, LINEARITY
L414	610 031 1367	INDUCTOR 202J
	610 211 3488	INDUCTOR
	645 005 5645	INDUCTOR, 2200U K
	645 007 8361	INDUCTOR, 2000U
L416A	645 013 8676	INDUCTOR, 350U
L601	610 078 6820	PIPE CORE
L621	610 078 5946	PIPE CORE
	652 000 1725	CORE, PIPE
L623	610 078 5946	PIPE CORE
	652 000 1725	CORE, PIPE
L625	610 078 5946	PIPE CORE
	652 000 1725	CORE, PIPE
L628	610 078 5946	PIPE CORE
	652 000 1725	CORE, PIPE
L721	645 001 4796	INDUCTOR, 150U K
L801	645 008 2894	INDUCTOR, 5.6U K
	645 016 3104	INDUCTOR, 5.6U K
L821	645 008 2894	INDUCTOR, 5.6U K
	645 016 3104	INDUCTOR, 5.6U K
L851	645 008 2894	INDUCTOR, 5.6U K
	645 016 3104	INDUCTOR, 5.6U K
L881	645 006 2490	INDUCTOR, 1U K
	645 016 2411	INDUCTOR, 1U K
L882	645 006 2490	INDUCTOR, 1U K
	645 016 2411	INDUCTOR, 1U K
★ L901	645 039 2559	COIL, DEGAUSSING
	645 041 1830	COIL, DEGAUSSING
	645 051 9215	COIL, DEGAUSSING
L1901	645 008 2894	INDUCTOR, 5.6U K
	645 016 3104	INDUCTOR, 5.6U K
L8007	645 008 2894	INDUCTOR, 5.6U K
	645 016 3104	INDUCTOR, 5.6U K
L8008	645 008 2894	INDUCTOR, 5.6U K
	645 016 3104	INDUCTOR, 5.6U K

Schematic Location	Part No.	Description
L8022	610 031 3873	INDUCTOR, 10U K
	645 016 2534	INDUCTOR, 10U K
L8024	610 031 3873	INDUCTOR, 10U K
	645 016 2534	INDUCTOR, 10U K
L8032	610 031 3873	INDUCTOR, 10U K
	645 016 2534	INDUCTOR, 10U K
L8036	610 031 3873	INDUCTOR, 10U K
	645 016 2534	INDUCTOR, 10U K
L8059	610 031 3873	INDUCTOR, 10U K
	645 016 2534	INDUCTOR, 10U K
L8070	645 008 2894	INDUCTOR, 5.6U K
	645 016 3104	INDUCTOR, 5.6U K
L8074	645 003 9812	INDUCTOR, 33U K
	645 016 2985	INDUCTOR, 33U K
L8091	645 008 2894	INDUCTOR, 5.6U K
	645 016 3104	INDUCTOR, 5.6U K
L8094	645 006 2490	INDUCTOR, 1U K
	645 016 2411	INDUCTOR, 1U K
L8098	645 006 2490	INDUCTOR, 1U K
	645 016 2411	INDUCTOR, 1U K

TRANSISTORS

Q001	405 011 8401	TR 2SC1740S-Q
	405 011 8500	TR 2SC1740S-R
	405 011 8609	TR 2SC1740S-S
	405 012 2002	TR 2SC1815-GR
	405 012 2101	TR 2SC1815-O
	405 012 2309	TR 2SC1815-Y
	405 020 7501	TR 2SC945A-PA
	405 020 7709	TR 2SC945A-QA
	405 020 7907	TR 2SC945A-RA
	405 151 8705	TR 2SC536NG-NPA
	405 157 0505	TR 2SC536NF-NPA
Q005	405 008 4805	TR 2SB764-E
	405 008 4904	TR 2SB764-F
Q171	405 011 8401	TR 2SC1740S-Q
	405 011 8500	TR 2SC1740S-R
	405 011 8609	TR 2SC1740S-S
	405 012 2002	TR 2SC1815-GR
	405 012 2101	TR 2SC1815-O
	405 012 2309	TR 2SC1815-Y
	405 020 7501	TR 2SC945A-PA
	405 020 7709	TR 2SC945A-QA
	405 020 7907	TR 2SC945A-RA
	405 151 8705	TR 2SC536NG-NPA
	405 157 0505	TR 2SC536NF-NPA
Q221	405 001 7407	TR 2SA1015-O(SAN)
	405 001 7605	TR 2SA1015-Y(SAN)
	405 004 3109	TR 2SA564A-Q(CU)
	405 004 3208	TR 2SA564A-R(CU)
	405 006 1707	TR 2SA933S-Q
	405 006 1806	TR 2SA933S-R
	405 151 3304	TR 2SA608NF-NPA
	406 000 6804	TR 2SA1015-GR(SAN)

Schematic Location	Part No.	Description
Q242	405 011 8401	TR 2SC1740S-Q
	405 011 8500	TR 2SC1740S-R
	405 011 8609	TR 2SC1740S-S
	405 012 2002	TR 2SC1815-GR
	405 012 2101	TR 2SC1815-O
	405 012 2309	TR 2SC1815-Y
	405 020 7501	TR 2SC945A-PA
	405 020 7709	TR 2SC945A-QA
	405 020 7907	TR 2SC945A-RA
	405 151 8705	TR 2SC536NG-NPA
	405 157 0505	TR 2SC536NF-NPA
Q271	405 002 0308	TR 2SA1037K-T-96-R
	405 002 0407	TR 2SA1037K-T-96-S
	405 002 6726	TR 2SA1179-M6
	405 002 6924	TR 2SA1179-M7-TB
	405 134 5925	TR 2SA1037AK T146 R
	405 147 2205	TR 2SA1037AK T146 S
	405 163 1503	TR 2SA1179N-M6-TB
	405 163 2708	TR 2SA1179N-M7-TB
Q301	405 014 4509	TR 2SC2412K-T-96-R
	405 014 4608	TR 2SC2412K-T-96-S
	405 015 8724	TR 2SC2812-L6-TB
	405 015 8922	TR 2SC2812-L7-TB
	405 163 1602	TR 2SC2812N-L6-TB
	405 163 1701	TR 2SC2812N-L7-TB
Q302	405 002 0308	TR 2SA1037K-T-96-R
	405 002 0407	TR 2SA1037K-T-96-S
	405 002 6726	TR 2SA1179-M6
	405 002 6924	TR 2SA1179-M7-TB
	405 134 5925	TR 2SA1037AK T146 R
	405 147 2205	TR 2SA1037AK T146 S
	405 163 1503	TR 2SA1179N-M6-TB
	405 163 2708	TR 2SA1179N-M7-TB
Q315	405 002 0308	TR 2SA1037K-T-96-R
	405 002 0407	TR 2SA1037K-T-96-S
	405 002 6726	TR 2SA1179-M6
	405 002 6924	TR 2SA1179-M7-TB
	405 134 5925	TR 2SA1037AK T146 R
	405 147 2205	TR 2SA1037AK T146 S
	405 163 1503	TR 2SA1179N-M6-TB
	405 163 2708	TR 2SA1179N-M7-TB
Q332	405 001 7407	TR 2SA1015-O(SAN)
	405 001 7605	TR 2SA1015-Y(SAN)
	405 004 3109	TR 2SA564A-Q(CU)
	405 004 3208	TR 2SA564A-R(CU)
	405 006 1707	TR 2SA933S-Q
	405 006 1806	TR 2SA933S-R
	405 151 3304	TR 2SA608NF-NPA
	406 000 6804	TR 2SA1015-GR(SAN)
Q340	405 001 7407	TR 2SA1015-O(SAN)
	405 001 7605	TR 2SA1015-Y(SAN)
	405 004 3109	TR 2SA564A-Q(CU)
	405 004 3208	TR 2SA564A-R(CU)
	405 006 1707	TR 2SA933S-Q

Schematic Location	Part No.	Description
Q340 (Cont.)	405 006 1806	TR 2SA933S-R
	405 151 3304	TR 2SA608NF-NPA
	406 000 6804	TR 2SA1015-GR(SAN)
Q401	405 013 6207	TR 2SC2271-D-CTV
	405 013 6306	TR 2SC2271-E-CTV
	405 029 7106	TR 2SC2271-D
	405 029 7205	TR 2SC2271-E
★ Q402	405 157 1304	TR 2SD2634-YB
Q429	405 011 8401	TR 2SC1740S-Q
	405 011 8500	TR 2SC1740S-R
	405 011 8609	TR 2SC1740S-S
	405 012 2002	TR 2SC1815-GR
	405 012 2101	TR 2SC1815-O
	405 012 2309	TR 2SC1815-Y
	405 020 7501	TR 2SC945A-PA
	405 020 7709	TR 2SC945A-QA
	405 020 7907	TR 2SC945A-RA
	405 151 8705	TR 2SC536NG-NPA
	405 157 0505	TR 2SC536NF-NPA
Q490	405 023 5009	TR 2SD400-E-MP
	405 023 5306	TR 2SD400-F-MP
★ Q601	405 095 9004	TR 2SC4423-CTV
Q604	405 058 0208	TR 2SC3807-R-CTV-YA
Q605	405 001 7407	TR 2SA1015-O(SAN)
	405 001 7605	TR 2SA1015-Y(SAN)
	405 004 3109	TR 2SA564A-Q(CU)
	405 004 3208	TR 2SA564A-R(CU)
	405 006 1707	TR 2SA933S-Q
	405 006 1806	TR 2SA933S-R
	405 151 3304	TR 2SA608NF-NPA
	406 000 6804	TR 2SA1015-GR(SAN)
Q627	405 009 6907	TR 2SB985-S
	405 009 7003	TR 2SB985-T
	405 089 0000	TR 2SA1707-S
	405 089 0109	TR 2SA1707-T
Q635	405 011 8401	TR 2SC1740S-Q
	405 011 8500	TR 2SC1740S-R
	405 011 8609	TR 2SC1740S-S
	405 012 2002	TR 2SC1815-GR
	405 012 2101	TR 2SC1815-O
	405 012 2309	TR 2SC1815-Y
	405 020 7501	TR 2SC945A-PA
	405 020 7709	TR 2SC945A-QA
	405 020 7907	TR 2SC945A-RA
	405 151 8705	TR 2SC536NG-NPA
	405 157 0505	TR 2SC536NF-NPA
Q681	405 011 8401	TR 2SC1740S-Q
	405 011 8500	TR 2SC1740S-R
	405 011 8609	TR 2SC1740S-S
	405 012 2002	TR 2SC1815-GR
	405 012 2101	TR 2SC1815-O
	405 012 2309	TR 2SC1815-Y
	405 020 7501	TR 2SC945A-PA
	405 020 7709	TR 2SC945A-QA

Schematic Location	Part No.	Description
	405 020 7907	TR 2SC945A-RA
	405 151 8705	TR 2SC536NG-NPA
	405 157 0505	TR 2SC536NF-NPA
Q688	405 001 7605	TR 2SA1015-Y(SAN)
	405 004 3208	TR 2SA564A-R(CU)
	405 006 1806	TR 2SA933S-R
	405 151 3304	TR 2SA608NF-NPA
	406 000 6804	TR 2SA1015-GR(SAN)
Q693	405 011 8401	TR 2SC1740S-Q
	405 011 8500	TR 2SC1740S-R
	405 011 8609	TR 2SC1740S-S
	405 012 2002	TR 2SC1815-GR
	405 012 2101	TR 2SC1815-O
	405 012 2309	TR 2SC1815-Y
	405 020 7501	TR 2SC945A-PA
	405 020 7709	TR 2SC945A-QA
	405 020 7907	TR 2SC945A-RA
	405 151 8705	TR 2SC536NG-NPA
	405 157 0505	TR 2SC536NF-NPA
Q695	405 001 7605	TR 2SA1015-Y(SAN)
	405 004 3208	TR 2SA564A-R(CU)
	405 004 4809	TR 2SA608-F-CTV-NP
Q701	405 001 7407	TR 2SA1015-O(SAN)
	405 001 7605	TR 2SA1015-Y(SAN)
	405 004 3109	TR 2SA564A-Q(CU)
	405 004 3208	TR 2SA564A-R(CU)
	405 006 1707	TR 2SA933S-Q
	405 006 1806	TR 2SA933S-R
	405 151 3304	TR 2SA608NF-NPA
	406 000 6804	TR 2SA1015-GR(SAN)
Q711	405 001 7407	TR 2SA1015-O(SAN)
	405 001 7605	TR 2SA1015-Y(SAN)
	405 004 3109	TR 2SA564A-Q(CU)
	405 004 3208	TR 2SA564A-R(CU)
	405 006 1707	TR 2SA933S-Q
	405 006 1806	TR 2SA933S-R
	405 151 3304	TR 2SA608NF-NPA
	406 000 6804	TR 2SA1015-GR(SAN)
Q721	405 001 7407	TR 2SA1015-O(SAN)
	405 001 7605	TR 2SA1015-Y(SAN)
	405 004 3109	TR 2SA564A-Q(CU)
	405 004 3208	TR 2SA564A-R(CU)
	405 006 1707	TR 2SA933S-Q
	405 006 1806	TR 2SA933S-R
	405 151 3304	TR 2SA608NF-NPA
	406 000 6804	TR 2SA1015-GR(SAN)
Q803	405 001 7407	TR 2SA1015-O(SAN)
	405 001 7605	TR 2SA1015-Y(SAN)
	405 004 3109	TR 2SA564A-Q(CU)
	405 004 3208	TR 2SA564A-R(CU)
	405 006 1707	TR 2SA933S-Q
	405 006 1806	TR 2SA933S-R
	405 151 3304	TR 2SA608NF-NPA
	406 000 6804	TR 2SA1015-GR(SAN)

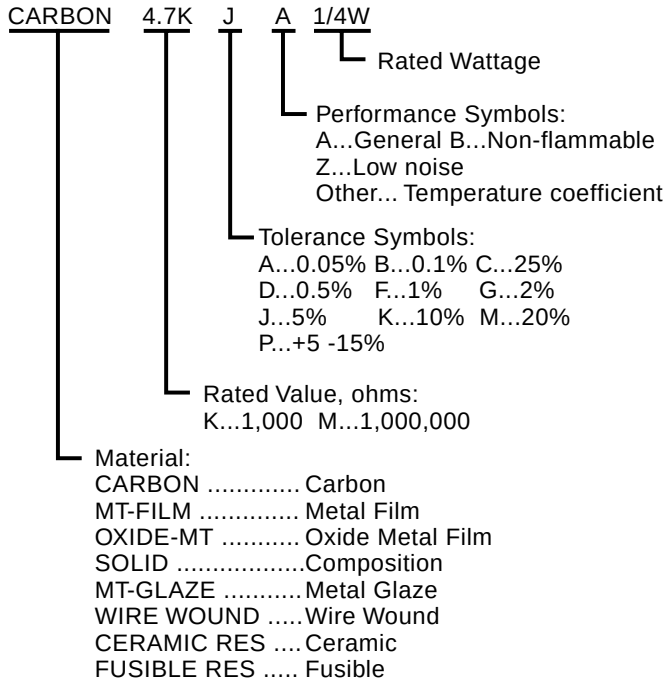
Schematic Location	Part No.	Description
Q831	405 001 7407	TR 2SA1015-O(SAN)
	405 001 7605	TR 2SA1015-Y(SAN)
	405 004 3109	TR 2SA564A-Q(CU)
	405 004 3208	TR 2SA564A-R(CU)
	405 006 1707	TR 2SA933S-Q
	405 006 1806	TR 2SA933S-R
	405 151 3304	TR 2SA608NF-NPA
	406 000 6804	TR 2SA1015-GR(SAN)
Q882	405 011 8401	TR 2SC1740S-Q
	405 011 8500	TR 2SC1740S-R
	405 011 8609	TR 2SC1740S-S
	405 012 2002	TR 2SC1815-GR
	405 012 2101	TR 2SC1815-O
	405 012 2309	TR 2SC1815-Y
	405 020 7501	TR 2SC945A-PA
	405 020 7709	TR 2SC945A-QA
	405 020 7907	TR 2SC945A-RA
	405 151 8705	TR 2SC536NG-NPA
	405 157 0505	TR 2SC536NF-NPA
Q1096	405 002 0308	TR 2SA1037K-T-96-R
	405 002 0407	TR 2SA1037K-T-96-S
	405 002 6726	TR 2SA1179-M6
	405 002 6924	TR 2SA1179-M7-TB
	405 134 5925	TR 2SA1037AK T146 R
	405 147 2205	TR 2SA1037AK T146 S
	405 163 1503	TR 2SA1179N-M6-TB
	405 163 2708	TR 2SA1179N-M7-TB
Q1097	405 014 4509	TR 2SC2412K-T-96-R
	405 014 4608	TR 2SC2412K-T-96-S
	405 015 8724	TR 2SC2812-L6-TB
	405 015 8922	TR 2SC2812-L7-TB
	405 163 1602	TR 2SC2812N-L6-TB
	405 163 1701	TR 2SC2812N-L7-TB
Q8000	405 023 5009	TR 2SD400-E-MP
	405 023 5306	TR 2SD400-F-MP
Q8005	405 011 8401	TR 2SC1740S-Q
	405 011 8500	TR 2SC1740S-R
	405 011 8609	TR 2SC1740S-S
	405 012 2002	TR 2SC1815-GR
	405 012 2101	TR 2SC1815-O
	405 012 2309	TR 2SC1815-Y
	405 020 7501	TR 2SC945A-PA
	405 020 7709	TR 2SC945A-QA
	405 020 7907	TR 2SC945A-RA
	405 151 8705	TR 2SC536NG-NPA
	405 157 0505	TR 2SC536NF-NPA
Q8006	405 011 8401	TR 2SC1740S-Q
	405 011 8500	TR 2SC1740S-R
	405 011 8609	TR 2SC1740S-S
	405 012 2002	TR 2SC1815-GR
	405 012 2101	TR 2SC1815-O
	405 012 2309	TR 2SC1815-Y
	405 020 7501	TR 2SC945A-PA
	405 020 7709	TR 2SC945A-QA

Schematic Location	Part No.	Description
	405 020 7907	TR 2SC945A-RA
	405 151 8705	TR 2SC536NG-NPA
	405 157 0505	TR 2SC536NF-NPA
Q8073	405 011 8401	TR 2SC1740S-Q
	405 011 8500	TR 2SC1740S-R
	405 011 8609	TR 2SC1740S-S
	405 012 2002	TR 2SC1815-GR
	405 012 2101	TR 2SC1815-O
	405 012 2309	TR 2SC1815-Y
	405 020 7501	TR 2SC945A-PA
	405 020 7709	TR 2SC945A-QA
	405 020 7907	TR 2SC945A-RA
	405 151 8705	TR 2SC536NG-NPA
	405 157 0505	TR 2SC536NF-NPA
Q8076	405 001 7407	TR 2SA1015-O(SAN)
	405 001 7605	TR 2SA1015-Y(SAN)
	405 004 3109	TR 2SA564A-Q(CU)
	405 004 3208	TR 2SA564A-R(CU)
	405 006 1707	TR 2SA933S-Q
	405 006 1806	TR 2SA933S-R
	405 151 3304	TR 2SA608NF-NPA
	406 000 6804	TR 2SA1015-GR(SAN)
Q8083	405 001 7407	TR 2SA1015-O(SAN)
	405 001 7605	TR 2SA1015-Y(SAN)
	405 004 3109	TR 2SA564A-Q(CU)
	405 004 3208	TR 2SA564A-R(CU)
	405 006 1707	TR 2SA933S-Q
	405 006 1806	TR 2SA933S-R
	405 151 3304	TR 2SA608NF-NPA
	406 000 6804	TR 2SA1015-GR(SAN)
Q8090	405 011 8401	TR 2SC1740S-Q
	405 011 8500	TR 2SC1740S-R
	405 011 8609	TR 2SC1740S-S
	405 012 2002	TR 2SC1815-GR
	405 012 2101	TR 2SC1815-O
	405 012 2309	TR 2SC1815-Y
	405 020 7501	TR 2SC945A-PA
	405 020 7709	TR 2SC945A-QA
	405 020 7907	TR 2SC945A-RA
	405 151 8705	TR 2SC536NG-NPA
	405 157 0505	TR 2SC536NF-NPA
Q8093	405 017 1901	TR 2SC3114-T
	405 039 3303	TR 2SC3114-R
	405 039 3402	TR 2SC3114-S
Q8097	405 017 1901	TR 2SC3114-T
	405 039 3303	TR 2SC3114-R
	405 039 3402	TR 2SC3114-S

Schematic Location	Part No.	Description

NOTES:
Read description of the Resistor as follows:

(Example)



R001	401 024 9701	CARBON	12K JA	1/6W
R002	401 024 9701	CARBON	12K JA	1/6W
R003	401 256 3805	MT-GLAZE	1.5K JA	1/10W
R004	401 256 3805	MT-GLAZE	1.5K JA	1/10W
R005	401 150 5905	MT-GLAZE	10K JA	1/10W
R006	401 023 1706	CARBON	820 JA	1/4W
R012	401 027 2600	CARBON	5.6K JA	1/6W
★ R106	401 008 2001	CARBON	18K JA	1/2W
R107	401 023 2802	CARBON	8.2K JA	1/4W
R113	401 255 6500	MT-GLAZE	100 JA	1/10W
R117	401 150 6001	MT-GLAZE	0.000 ZA	1/10W
R171	401 255 6500	MT-GLAZE	100 JA	1/10W
R172	401 150 6001	MT-GLAZE	0.000 ZA	1/10W
R173	401 162 2800	MT-GLAZE	1.8K JA	1/10W
R201	401 150 6001	MT-GLAZE	0.000 ZA	1/10W
R202	401 150 5905	MT-GLAZE	10K JA	1/10W
R204	401 025 7409	CARBON	220 JA	1/6W
R205	401 025 7409	CARBON	220 JA	1/6W
R209	401 255 6500	MT-GLAZE	100 JA	1/10W
R210	401 255 6500	MT-GLAZE	100 JA	1/10W
R212	401 150 5905	MT-GLAZE	10K JA	1/10W
R216	401 162 2909	MT-GLAZE	220 JA	1/10W
R217	401 255 6500	MT-GLAZE	100 JA	1/10W
R218	401 255 6500	MT-GLAZE	100 JA	1/10W
R219	401 255 6500	MT-GLAZE	100 JA	1/10W
R220	401 255 6500	MT-GLAZE	100 JA	1/10W
R221	401 150 6001	MT-GLAZE	0.000 ZA	1/10W
R222	401 264 1909	MT-GLAZE	10K FA	1/10W
R228	401 255 6500	MT-GLAZE	100 JA	1/10W

Schematic Location	Part No.	Description

R229	401 255 6500	MT-GLAZE	100 JA	1/10W
R236	401 024 6700	CARBON	100 JA	1/6W
R237	401 150 6209	MT-GLAZE	1K JA	1/10W
R238	401 027 0309	CARBON	47K JA	1/6W
R248	401 162 3005	MT-GLAZE	22K JA	1/10W
R249	401 162 3005	MT-GLAZE	22K JA	1/10W
R250	401 256 0309	MT-GLAZE	820 JA	1/10W
R251	401 256 5908	MT-GLAZE	2.7K JA	1/10W
R253	401 024 7004	CARBON	1K JA	1/6W
R271	401 150 5905	MT-GLAZE	10K JA	1/10W
R272	401 150 6209	MT-GLAZE	1K JA	1/10W
R273	401 256 7506	MT-GLAZE	390 JA	1/10W
R276	401 024 7400	CARBON	10K JA	1/6W
R287	401 150 6001	MT-GLAZE	0.000 ZA	1/10W
R288	401 150 6001	MT-GLAZE	0.000 ZA	1/10W
R289	401 150 6001	MT-GLAZE	0.000 ZA	1/10W
R302	401 256 0101	MT-GLAZE	8.2K JA	1/10W
R303	401 150 5905	MT-GLAZE	10K JA	1/10W
R304	401 256 0309	MT-GLAZE	820 JA	1/10W
R307	401 256 0309	MT-GLAZE	820 JA	1/10W
R308	401 162 2701	MT-GLAZE	180 JA	1/10W
R309	401 150 6100	MT-GLAZE	2.2K JA	1/10W
R311	401 024 6700	CARBON	100 JA	1/6W
R312	401 162 4101	MT-GLAZE	5.6K JA	1/10W
R315	401 256 4109	MT-GLAZE	56 JA	1/10W
R316	401 150 6209	MT-GLAZE	1K JA	1/10W
R317	401 256 4109	MT-GLAZE	56 JA	1/10W
R323	401 027 2105	CARBON	56 JA	1/6W
R324	401 027 2600	CARBON	5.6K JA	1/6W
R326	401 150 6001	MT-GLAZE	0.000 ZA	1/10W
R335	401 027 2105	CARBON	56 JA	1/6W
R336	401 024 7004	CARBON	1K JA	1/6W
R3445	401 256 1405	MT-GLAZE	330K JA	1/10W
R3447	401 256 1405	MT-GLAZE	330K JA	1/10W
R3456	401 255 6500	MT-GLAZE	100 JA	1/10W
R3458	401 255 6500	MT-GLAZE	100 JA	1/10W
R3461	401 162 2800	MT-GLAZE	1.8K JA	1/10W
R3462	401 150 6100	MT-GLAZE	2.2K JA	1/10W
R351	401 024 6700	CARBON	100 JA	1/6W
R352	401 024 6700	CARBON	100 JA	1/6W
R355	401 150 6100	MT-GLAZE	2.2K JA	1/10W
R356	401 150 6001	MT-GLAZE	0.000 ZA	1/10W
R357	401 255 6500	MT-GLAZE	100 JA	1/10W
R358	401 256 1702	MT-GLAZE	33K JA	1/10W
R360	401 256 3201	MT-GLAZE	1.5M JA	1/10W
R363	401 256 7308	MT-GLAZE	6.8K JA	1/10W
R365	401 024 7004	CARBON	1K JA	1/6W
R366	401 162 3104	MT-GLAZE	3.3K JA	1/10W
R371	401 012 5807	CARBON	1K JB	1/4W
R380	401 024 7400	CARBON	10K JA	1/6W
R381	401 024 7400	CARBON	10K JA	1/6W
R404	401 026 3905	CARBON	330 JA	1/6W
R405	401 150 6209	MT-GLAZE	1K JA	1/10W
★ R406	401 010 8305	CARBON	5.6K JA	1/2W

Schematic Location	Part No.	Description		
★ R407	401 068 4700	OXIDE-MT	4.7K JA	2W
★ R414	402 080 3108	OXIDE-MT	4.7 JB	5W
R418	401 009 1607	CARBON	2.7K JB	1/2W
★ R421	401 053 1202	MT-FILM	2.2K FA	1/6W
★ R422	401 052 6802	MT-FILM	10K FA	1/6W
★ R423	401 264 9301	MT-GLAZE	3.3K FA	1/10W
R428	401 025 1902	CARBON	15K JA	1/6W
R429	401 024 6700	CARBON	100 JA	1/6W
R434	401 026 7606	CARBON	390K JA	1/6W
R461	401 026 4902	CARBON	330K JA	1/6W
R462	401 024 7400	CARBON	10K JA	1/6W
★ R463	401 061 0006	OXIDE-MT	3.3 JA	1W
R464	401 025 4606	CARBON	18K JA	1/6W
★ R467	401 065 3706	OXIDE-MT	1.2K JA	2W
R468	401 025 8208	CARBON	22K JA	1/6W
R471	401 255 9709	MT-GLAZE	82K JA	1/10W
R481	401 006 7701	CARBON	1 JB	1/2W
R482	401 011 9004	CARBON	1 JB	1/4W
R483	401 006 7701	CARBON	1 JB	1/2W
R485	401 162 3104	MT-GLAZE	3.3K JA	1/10W
★ R488	401 059 1602	OXIDE-MT	15 JA	1W
★ R489	401 065 1801	OXIDE-MT	12 JA	2W
R491	401 012 5708	CARBON	1K JA	1/4W
R493	401 014 6109	CARBON	150K JA	1/4W
R494	401 014 6109	CARBON	150K JA	1/4W
★ R497	401 064 5305	OXIDE-MT	1.5 JA	2W
R499	401 026 6609	CARBON	390 JA	1/6W
R503	401 026 9907	CARBON	4.7K JA	1/6W
R504	401 027 8602	CARBON	8.2K JA	1/6W
R505	401 006 8401	CARBON	1.5 JA	1/2W
R506	401 027 5205	CARBON	680 JA	1/6W
R507	401 006 8807	CARBON	1.8 JA	1/2W
R508	401 026 7408	CARBON	39K JA	1/6W
R509	401 025 4606	CARBON	18K JA	1/6W
★ R511	401 066 6102	OXIDE-MT	220 JA	2W
R512	401 007 1104	CARBON	1K JA	1/2W
R517	401 026 7408	CARBON	39K JA	1/6W
R518	401 256 7209	MT-GLAZE	18K JA	1/10W
★ R601	402 083 6106	WIRE WOUND	1 KA	7W
★ R602	402 000 1603	SOLID	3.3M MA	1/2W
	402 088 1502	RESISTER	3.3M JA	1/2W
R603	401 007 2309	CARBON	100K JA	1/2W
★ R604	401 064 6302	OXIDE-MT	10 JA	2W
★ R613	401 068 6902	OXIDE-MT	56 JA	2W
R614	401 011 1107	CARBON	68 JA	1/2W
R615	401 014 5201	CARBON	15K JA	1/4W
R616	401 026 2809	CARBON	3K GA	1/6W
R617	401 099 1501	CARBON	680 GA	1/6W
★ R618	401 068 6902	OXIDE-MT	56 JA	2W
R619	401 025 8208	CARBON	22K JA	1/6W
R620	401 027 2600	CARBON	5.6K JA	1/6W
R621	401 162 3708	MT-GLAZE	4.7K JA	1/10W
R622	401 026 2809	CARBON	3K GA	1/6W
R627	401 024 7400	CARBON	10K JA	1/6W

Schematic Location	Part No.	Description		
R628	401 013 5301	CARBON	1.2K JA	1/4W
R629	401 150 6209	MT-GLAZE	1K JA	1/10W
★ R630	401 060 5002	OXIDE-MT	22K JA	1W
R631	401 022 3107	CARBON	6.8K JA	1/4W
R632	401 150 6209	MT-GLAZE	1K JA	1/10W
R634	401 256 6301	MT-GLAZE	47K JA	1/10W
R683	401 027 2600	CARBON	5.6K JA	1/6W
R687	401 162 3005	MT-GLAZE	22K JA	1/10W
R688	401 256 0408	MT-GLAZE	12K JA	1/10W
R691	401 024 7400	CARBON	10K JA	1/6W
R692	401 027 5908	CARBON	68K JA	1/6W
R693	401 027 3201	CARBON	560K JA	1/6W
R694	401 024 7400	CARBON	10K JA	1/6W
R695	401 025 8208	CARBON	22K JA	1/6W
R701	401 027 8107	CARBON	82 JA	1/6W
R702	401 025 1308	CARBON	150 JA	1/6W
R703	401 024 7004	CARBON	1K JA	1/6W
R704	401 158 1800	CARBON	100 JB	1/6W
★ R705	401 058 3706	OXIDE-MT	1K JA	1W
R711	401 027 8107	CARBON	82 JA	1/6W
R712	401 025 1308	CARBON	150 JA	1/6W
R713	401 024 7004	CARBON	1K JA	1/6W
R714	401 158 1800	CARBON	100 JB	1/6W
★ R715	401 058 3706	OXIDE-MT	1K JA	1W
R721	401 027 8107	CARBON	82 JA	1/6W
R722	401 025 1308	CARBON	150 JA	1/6W
R723	401 024 7004	CARBON	1K JA	1/6W
R724	401 158 1800	CARBON	100 JB	1/6W
★ R725	401 058 3706	OXIDE-MT	1K JA	1W
R731	401 024 7004	CARBON	1K JA	1/6W
R732	401 025 0004	CARBON	120K JA	1/6W
R803	401 024 7004	CARBON	1K JA	1/6W
R806	401 162 3708	MT-GLAZE	4.7K JA	1/10W
R804	401 255 6500	MT-GLAZE	100 JA	1/10W
R807	401 150 5905	MT-GLAZE	10K JA	1/10W
R808	401 150 5905	MT-GLAZE	10K JA	1/10W
R809	401 162 3708	MT-GLAZE	4.7K JA	1/10W
R810	401 024 7400	CARBON	10K JA	1/6W
R813	401 150 5905	MT-GLAZE	10K JA	1/10W
R814	401 150 5905	MT-GLAZE	10K JA	1/10W
R816	401 152 3206	MT-GLAZE	330 JA	1/10W
R821	401 162 3708	MT-GLAZE	4.7K JA	1/10W
R822	401 162 3708	MT-GLAZE	4.7K JA	1/10W
R823	401 256 6301	MT-GLAZE	47K JA	1/10W
R824	401 024 6700	CARBON	100 JA	1/6W
R825	401 150 5905	MT-GLAZE	10K JA	1/10W
R829	401 024 6700	CARBON	100 JA	1/6W
R835	401 026 1000	CARBON	2.7K JA	1/6W
R841	401 162 2800	MT-GLAZE	1.8K JA	1/10W
R842	401 256 0309	MT-GLAZE	820 JA	1/10W
R843	401 256 0309	MT-GLAZE	820 JA	1/10W
R844	401 256 0309	MT-GLAZE	820 JA	1/10W
R846	401 162 4101	MT-GLAZE	5.6K JA	1/10W
R847	401 162 4101	MT-GLAZE	5.6K JA	1/10W

Schematic Location	Part No.	Description
R848	401 162 4101	MT-GLAZE 5.6K JA 1/10W
R849	401 162 4101	MT-GLAZE 5.6K JA 1/10W
R851	401 024 7004	CARBON 1K JA 1/6W
R852	401 026 7408	CARBON 39K JA 1/6W
R853	401 256 3201	MT-GLAZE 1.5M JA 1/10W
R854	401 256 3805	MT-GLAZE 1.5K JA 1/10W
R856	401 255 6500	MT-GLAZE 100 JA 1/10W
R857	401 255 6500	MT-GLAZE 100 JA 1/10W
R861	401 024 6700	CARBON 100 JA 1/6W
R867	401 024 7400	CARBON 10K JA 1/6W
R872	401 256 3607	MT-GLAZE 15K JA 1/10W
R873	401 162 3005	MT-GLAZE 22K JA 1/10W
R874	401 255 6500	MT-GLAZE 100 JA 1/10W
R875	401 255 6500	MT-GLAZE 100 JA 1/10W
R876	401 255 6500	MT-GLAZE 100 JA 1/10W
R877	401 255 6500	MT-GLAZE 100 JA 1/10W
R881	401 255 6500	MT-GLAZE 100 JA 1/10W
R882	401 255 6500	MT-GLAZE 100 JA 1/10W
R883	401 255 6500	MT-GLAZE 100 JA 1/10W
R884	401 255 6500	MT-GLAZE 100 JA 1/10W
R886	401 150 5905	MT-GLAZE 10K JA 1/10W
R896	401 150 6001	MT-GLAZE 0.000 ZA 1/10W
R897	401 150 6001	MT-GLAZE 0.000 ZA 1/10W
R898	401 150 6001	MT-GLAZE 0.000 ZA 1/10W
R899	401 150 6001	MT-GLAZE 0.000 ZA 1/10W
R1001	401 256 2709	MT-GLAZE 75 JA 1/10W
R1002	401 256 2709	MT-GLAZE 75 JA 1/10W
R1011	401 256 2709	MT-GLAZE 75 JA 1/10W
R1012	401 256 6004	MT-GLAZE 27K JA 1/10W
R1013	401 024 9701	CARBON 12K JA 1/6W
R1021	401 256 2709	MT-GLAZE 75 JA 1/10W
R1026	401 026 9600	CARBON 470 JA 1/6W
R1027	401 162 3708	MT-GLAZE 4.7K JA 1/10W
R1041	401 162 3005	MT-GLAZE 22K JA 1/10W
R1042	401 162 3005	MT-GLAZE 22K JA 1/10W
R1043	401 162 3005	MT-GLAZE 22K JA 1/10W
R1046	401 150 5905	MT-GLAZE 10K JA 1/10W
R1047	401 256 6004	MT-GLAZE 27K JA 1/10W
R1048	401 150 5905	MT-GLAZE 10K JA 1/10W
R1049	401 256 6004	MT-GLAZE 27K JA 1/10W
R1051	401 256 2709	MT-GLAZE 75 JA 1/10W
R1052	401 255 6500	MT-GLAZE 100 JA 1/10W
R1053	401 256 2709	MT-GLAZE 75 JA 1/10W
R1054	401 255 6500	MT-GLAZE 100 JA 1/10W
R1055	401 256 2709	MT-GLAZE 75 JA 1/10W
R1056	401 255 6500	MT-GLAZE 100 JA 1/10W
R1074	401 150 6001	MT-GLAZE 0.000 ZA 1/10W
R1078	401 150 6001	MT-GLAZE 0.000 ZA 1/10W
R1082	401 150 6001	MT-GLAZE 0.000 ZA 1/10W
R1096	401 150 5905	MT-GLAZE 10K JA 1/10W
R1097	401 150 5905	MT-GLAZE 10K JA 1/10W
R1098	401 150 6209	MT-GLAZE 1K JA 1/10W
R1209	401 150 6001	MT-GLAZE 0.000 ZA 1/10W
R1210	401 150 6001	MT-GLAZE 0.000 ZA 1/10W

Schematic Location	Part No.	Description
R1901	401 150 5905	MT-GLAZE 10K JA 1/10W
R1902	401 150 6209	MT-GLAZE 1K JA 1/10W
R1903	401 162 2800	MT-GLAZE 1.8K JA 1/10W
R1904	401 150 6100	MT-GLAZE 2.2K JA 1/10W
R1905	401 256 7605	MT-GLAZE 3.9K JA 1/10W
R1906	401 162 4101	MT-GLAZE 5.6K JA 1/10W
R1907	401 256 0408	MT-GLAZE 12K JA 1/10W
R1909	401 024 7004	CARBON 1K JA 1/6W
R1910	401 024 7004	CARBON 1K JA 1/6W
R3401	401 025 7409	CARBON 220 JA 1/6W
R3402	401 025 7409	CARBON 220 JA 1/6W
R3406	401 150 5806	MT-GLAZE 100K JA 1/10W
R3407	401 255 6005	MT-GLAZE 1M JA 1/10W
R3411	401 265 4008	MT-GLAZE 62K JA 1/10W
R3421	401 162 3104	MT-GLAZE 3.3K JA 1/10W
R3422	401 255 6401	MT-GLAZE 3K JA 1/10W
R3426	401 256 7605	MT-GLAZE 3.9K JA 1/10W
R3432	401 150 5905	MT-GLAZE 10K JA 1/10W
R3433	401 150 5905	MT-GLAZE 10K JA 1/10W
R3434	401 162 4002	MT-GLAZE 560 JA 1/10W
R3435	401 150 5806	MT-GLAZE 100K JA 1/10W
R3436	401 162 4002	MT-GLAZE 560 JA 1/10W
R3437	401 150 5806	MT-GLAZE 100K JA 1/10W
R3441	401 256 1405	MT-GLAZE 330K JA 1/10W
R3442	401 255 6500	MT-GLAZE 100 JA 1/10W
R3443	401 256 1405	MT-GLAZE 330K JA 1/10W
R3444	401 255 6500	MT-GLAZE 100 JA 1/10W
★ R8001	401 068 6902	OXIDE-MT 56 JA 2W
★ R8002	401 064 7507	OXIDE-MT 100 JA 2W
R8003	401 256 6301	MT-GLAZE 47K JA 1/10W
R8004	401 256 6301	MT-GLAZE 47K JA 1/10W
R8005	401 162 3708	MT-GLAZE 4.7K JA 1/10W
R8006	401 162 3708	MT-GLAZE 4.7K JA 1/10W
R8009	401 026 9600	CARBON 470 JA 1/6W
R8011	401 255 7002	MT-GLAZE 51 JA 1/10W
R8012	401 255 6609	MT-GLAZE 300 JA 1/10W
R8013	401 150 5806	MT-GLAZE 100K JA 1/10W
R8014	401 255 9600	MT-GLAZE 820K JA 1/10W
R8015	401 255 5800	MT-GLAZE 2K JA 1/10W
R8036	401 150 5806	MT-GLAZE 100K JA 1/10W
R8037	401 256 3607	MT-GLAZE 15K JA 1/10W
R8043	401 256 3607	MT-GLAZE 15K JA 1/10W
R8044	401 256 3607	MT-GLAZE 15K JA 1/10W
R8055	401 256 4901	MT-GLAZE 360 JA 1/10W
R8056	401 162 3609	MT-GLAZE 470 JA 1/10W
R8061	401 256 3607	MT-GLAZE 15K JA 1/10W
R8071	401 162 3005	MT-GLAZE 22K JA 1/10W
R8072	401 162 3005	MT-GLAZE 22K JA 1/10W
R8073	401 150 6209	MT-GLAZE 1K JA 1/10W
R8074	401 150 6209	MT-GLAZE 1K JA 1/10W
R8076	401 256 6202	MT-GLAZE 270 JA 1/10W
R8077	401 256 6905	MT-GLAZE 680 JA 1/10W
R8081	401 152 3206	MT-GLAZE 330 JA 1/10W
R8082	401 256 6608	MT-GLAZE 68K JA 1/10W

Schematic Location	Part No.	Description
R8083	401 256 1405	MT-GLAZE 330K JA 1/10W
R8084	401 150 6001	MT-GLAZE 0.000 ZA 1/10W
R8085	401 256 3805	MT-GLAZE 1.5K JA 1/10W
R8088	401 256 3607	MT-GLAZE 15K JA 1/10W
R8089	401 256 3607	MT-GLAZE 15K JA 1/10W
R8090	401 025 8208	CARBON 22K JA 1/6W
R8091	401 150 5905	MT-GLAZE 10K JA 1/10W
R8092	401 256 7209	MT-GLAZE 18K JA 1/10W
R8093	401 256 6301	MT-GLAZE 47K JA 1/10W
R8095	401 150 5905	MT-GLAZE 10K JA 1/10W
R8096	401 256 7209	MT-GLAZE 18K JA 1/10W
R8097	401 256 6301	MT-GLAZE 47K JA 1/10W

SWITCHES

SW1901	645 006 9673	SWITCH, PUSH (POWER)
	645 027 7382	SWITCH, PUSH (POWER)
	645 052 2284	SWITCH, PUSH (POWER)
SW1902	645 006 9673	SWITCH, PUSH (VOL +)
	645 027 7382	SWITCH, PUSH (VOL +)
	645 052 2284	SWITCH, PUSH (VOL +)
SW1903	645 006 9673	SWITCH, PUSH (VOL –)
	645 027 7382	SWITCH, PUSH (VOL –)
	645 052 2284	SWITCH, PUSH (VOL –)
SW1904	645 006 9673	SWITCH, PUSH (CH ▲)
	645 027 7382	SWITCH, PUSH (CH ▲)
	645 052 2284	SWITCH, PUSH (CH ▲)
SW1905	645 006 9673	SWITCH, PUSH (CH ▼)
	645 027 7382	SWITCH, PUSH (CH ▼)
	645 052 2284	SWITCH, PUSH (CH ▼)
SW1906	645 006 9673	SWITCH, PUSH (MENU)
	645 027 7382	SWITCH, PUSH (MENU)
	645 052 2284	SWITCH, PUSH (MENU)

TRANSFORMERS

T401	610 000 1138	DRIVE TRANS
	610 223 1663	DRIVE TRANS
★ T402	645 032 8978	TRANS, FLYBACK
★ T601	645 035 9910	TRANS, POWER, PULSE
	645 041 5944	TRANS, POWER, PULSE
	645 045 6169	TRANS, POWER, PULSE

CRYSTAL/FILTERS

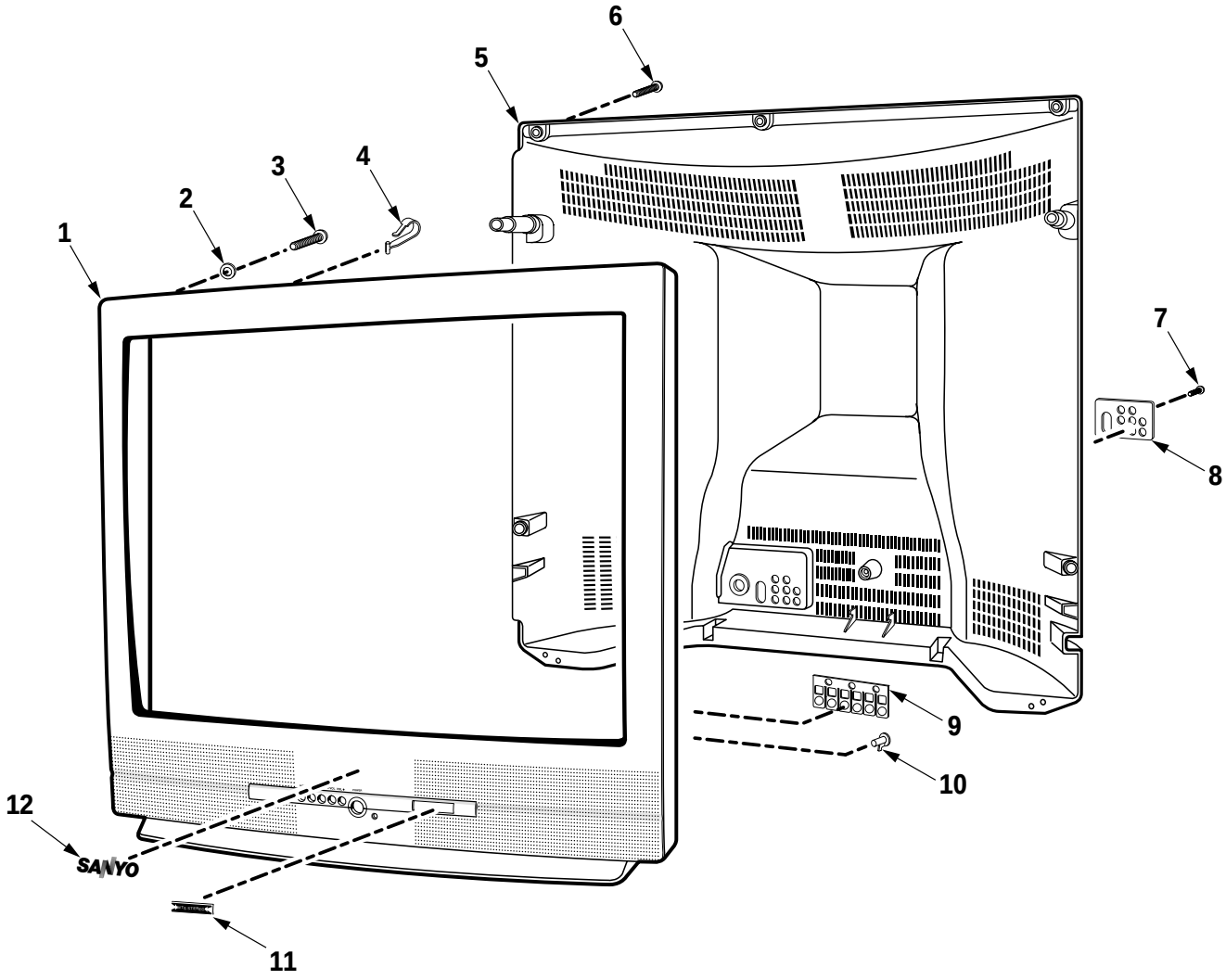
X201	610 015 3899	CRYSTAL OSCILLATOR
	645 014 3045	OSC, CRYSTAL 3.579545MHZ
X801	645 000 6692	OSC, CERAMIC 8.00MHZ
	645 021 5483	OSC, CERAMIC 8.00MHZ
X8011	645 041 1564	OSC, CRYSTAL 14.31818MHZ

Schematic Location	Part No.	Description

MISCELLANEOUS

A100	610 300 2125	ASSY, PWB, MAIN G7SVM
★ A101	645 053 4553	TUNER, TU/IF
A700	610 300 6802	ASSY, PWB, CRT G7SVM
A1000	610 300 2132	ASSY, PWB, AV G7SVM
A1901	645 047 6228	UNIT, REMOCON RECEIVER
★ F601	423 007 1601	FUSE 125V 4A
	423 007 1809	FUSE 125V 4A
	423 018 8101	FUSE 125V 4A
	423 029 8008	FUSE 125V 4A
F601A	645 000 5077	HOLDER, FUSE
	645 016 0479	HOLDER, FUSE
F601B	645 000 5077	HOLDER, FUSE
	645 016 0479	HOLDER, FUSE
★ K701	645 025 6103	SOCKET, CRT 8P
	645 028 0306	SOCKET, CRT 8P
K1001	645 052 6886	TERMINAL, BOARD
K1003	645 032 8954	JACK, RCA-2
K1051	645 052 6619	SOCKET, DIN 4P
★ PS601	408 046 5209	TH PTDAA1BF3R0Q100
★ Q901	414 010 6905	CRT M78JUA361X72
★ RL601	645 000 4155	RELAY
	645 011 2713	RELAY
	645 015 8629	RELAY
	645 024 7767	RELAY
	645 024 7828	RELAY
	645 052 5933	RELAY
SP901	645 013 6306	SPEAKER, 8
SP902	645 013 6306	SPEAKER, 8
★ W601	645 030 5290	CORD, POWER-2.0MK
★ W901	610 264 8362	ASSY, WIRE GND CONN.
	610 267 0325	(MEX) GND CONNECTOR

CABINET PARTS LIST



CABINET PARTS LIST

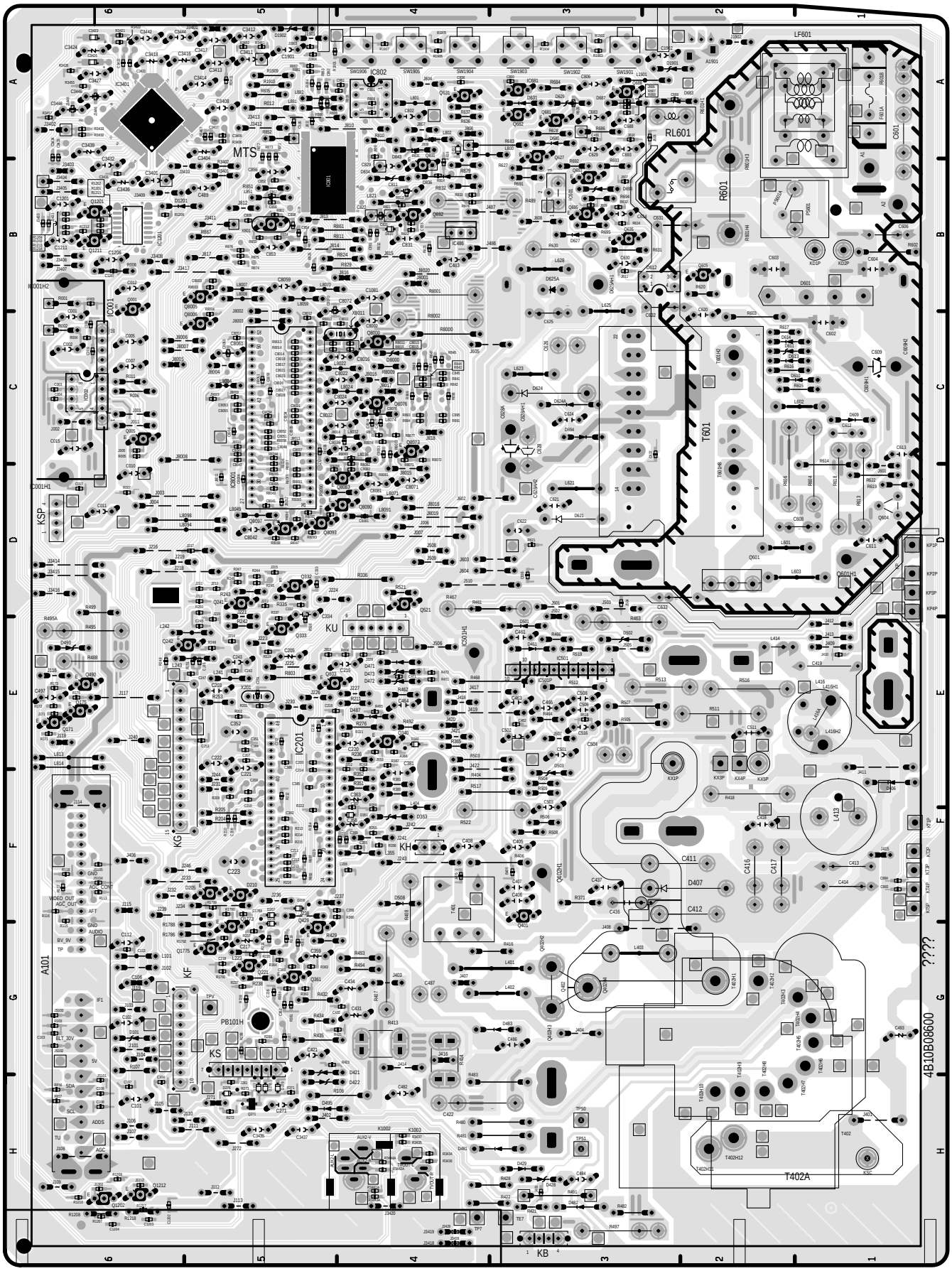
KEY NO.	PARTS NO.	DESCRIPTION
1	610 295 9048	CABINET FRONT ASSY
2	610 268 9648	CRT MTG WASHER (BTM)
	610 268 9662	CRT MTG WASHER (TOP)
3	412 053 3905	CRT MTG SCREW (4 USED)
4	610 102 7151	D COIL HOLDER (4 USED)
5	610 300 2293	CABINET BACK
6	412 064 4304	SCREW 4X14 (8 USED)
7	411 026 2303	SCREW 3X10 (3 USED)
8	610 302 5148	DEC AV SHEET
9	610 295 7884	BUTTON UNIT
10	610 267 0851	CAP RC
11	610 299 5763	DEC SHEET
12	610 293 2560	SANYO BADGE

ACCESSORY PARTS LIST

KEY NO.	PARTS NO.	DESCRIPTION
	610 299 9600	OWNER'S MANUAL
	645 052 5018	RC TRANSMITTER
	610 298 2398	RC BATTERY COVER

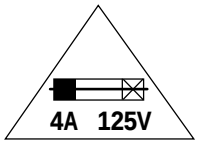
COMPONENT AND TESTPOINT LOCATIONS

MAIN BOARD FOIL SIDE



COMPONENT AND TESTPOINT LOCATIONS (Cont.)

CAUTION



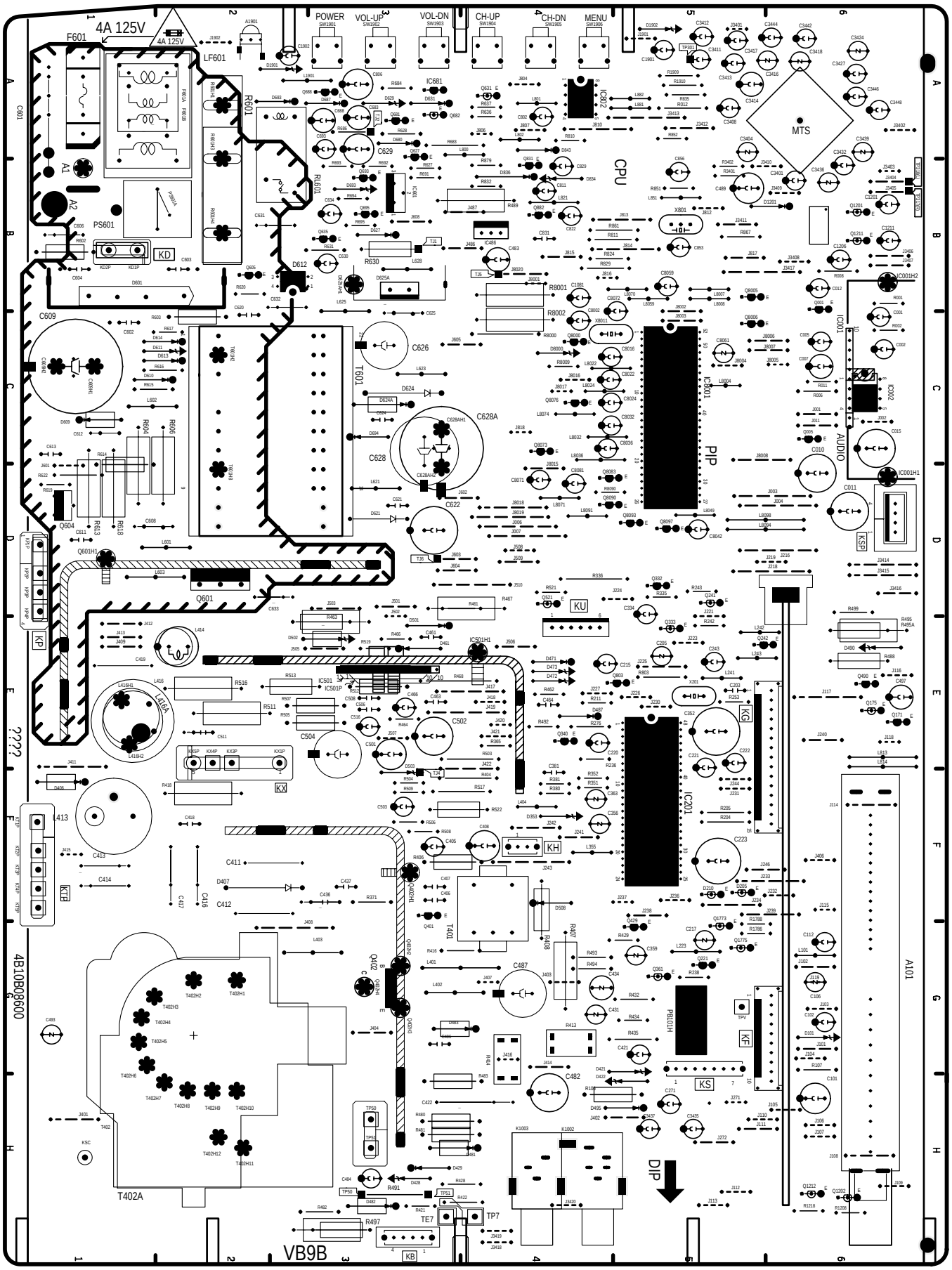
FOR CONTINUED PROTECTION AGAINST A RISK OF FIRE, REPLACE ONLY WITH THE SAME TYPE 4A, 125V FUSE.

ATTENTION : POUR MAINTENIR LA PROTECTION CONTRE LES RISQUES D' INCENDIE UTILISER UN FUSIBLE DE RECHANGE DE MEME TYPE 4A, 125V.

MAIN BOARD COMPONENTS AND TEST POINTS GRID LOCATIONS

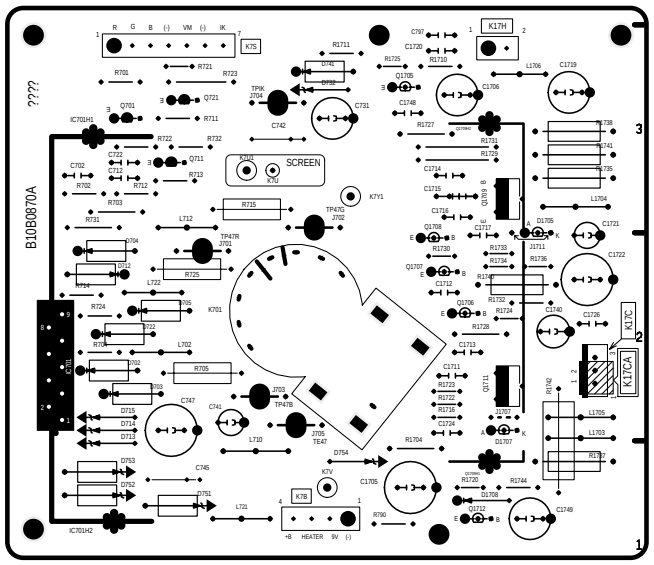
Part	Loc.	Part	Loc.	Part	Loc.
D429	H3	Q332	D5	Q8005	B5
D495	H5	Q340	E4	Q8006	C5
D612	B2	Q401	F3	Q8073	C4
IC002	C6	Q402	G3	Q8076	C4
IC201	F5	Q429	G4	Q8083	D4
IC486	B4	Q490	E6	Q8090	D4
IC501P	E3	Q601	D2	Q8093	D5
IC601	B3	Q604	D1	Q8097	D5
IC681	A3	Q605	B2	R513	E3
IC801	B5	Q627	A3	TE7	H4
IC802	A4	Q635	B3	TP7	H3
IC3401	A6	Q681	A3	TPV	G5
IC8001	C5	Q688	A3	TJ1	B3
Q001	B6	Q693	B3	TJ4	F3
Q005	C6	Q695	B3	TP50	H3
Q171	E6	Q803	E4	TP51	H3
Q221	G5	Q831	B4	TP317	B6
Q242	E6	Q882	B4	TP318	B6
Q271	H5	Q8000	C4		

MAIN BOARD PARTS SIDE

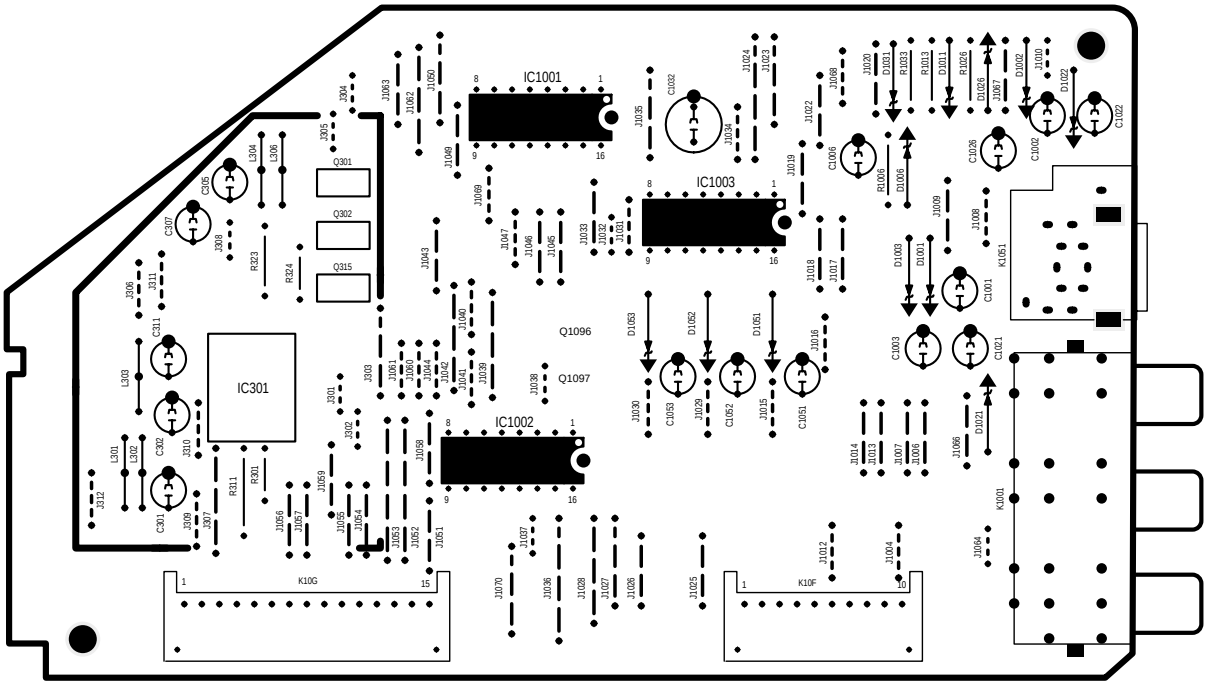


COMPONENT AND TESTPOINT LOCATIONS (Cont.)

PICTURE TUBE SOCKET BOARD



AUDIO/VIDEO BOARD



For parts or service contact

SANYO Fisher Service Corporation
21605 Plummer Street
Chatsworth, CA 91311 (U.S.A.)

300 Applewood Crescent,
Concord, Ontario L4K 5C7 (CANADA)

August / 2002 / 2000 SMC

Printed in U.S.A.

MODEL DS31820 Chassis No. 31820-00

SCHEMATIC DIAGRAMS

NOTES ON SCHEMATIC DIAGRAMS

1. All resistance values in ohms K=1,000 M=1,000,000.
2. Unless otherwise noted on schematic, all capacitor values less than 1 are expressed in µF (Micro Farad), and the values more than 1 are in pF.
3. Unless otherwise noted on schematic, voltage reading taken with VOM from point indicated to chassis ground. Voltage reading taken using color-bar signal VHF channel 5, all controls at normal. Line voltage at 120 volts. Some voltages may vary with signal strength.
4. Waveforms were taken with color-bar signal and controls set for normal picture. Waveforms marked with an ✻ may vary with signal strength.
5. The Symbol (WW) indicates a fusible resistor, which protects the circuit from possible short circuits.

SERVICE NOTES:

1. When replacing parts on circuit boards, clamp the lead wires to terminals before soldering.
2. When replacing high wattage resistors on circuit board, keep the resistor body 10 mm (3/8) from circuit board.
3. Keep wires away from high voltage and high temperature components.

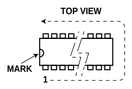
PRODUCT SAFETY NOTICE

THE COMPONENTS DESIGNATED BY A STAR (✻) ON THIS SCHEMATIC DIAGRAM DESIGNATE COMPONENTS WHOSE VALUES ARE OF SPECIAL SIGNIFICANCE TO PRODUCT SAFETY. SHOULD ANY COMPONENT DESIGNATED BY A STAR NEED TO BE REPLACED, USE ONLY THE PART DESIGNATED IN THE PARTS LIST. DO NOT DEVIATE FROM THE RESISTANCE, WATTAGE AND VOLTAGE RATINGS SHOWN.

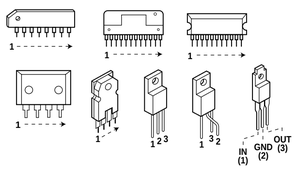
X-RADIATION WARNING NOTE

THIS TV CONTAINS CRITICAL PARTS TO PROTECT AGAINST X-RADIATION. NOMINAL 2ND ANODE VOLTAGE IS 29.0KV AT ZERO BEAM CURRENT AT 120 VOLTS AC LINE, AND MUST NOT EXCEED 30.0KV UNDER ANY OPERATING CONDITION. SEE HIGH VOLTAGE CHECK ON PAGE 9.

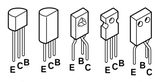
INTEGRATED CIRCUITS



SIDE VIEW

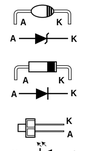


TRANSISTORS



B ... BASE
C ... COLLECTOR
E ... EMITTER

DIODES



INFRARED EMITTING

A....ANODE
K....CATHODE

CHIP TRANSISTORS

TOP VIEW

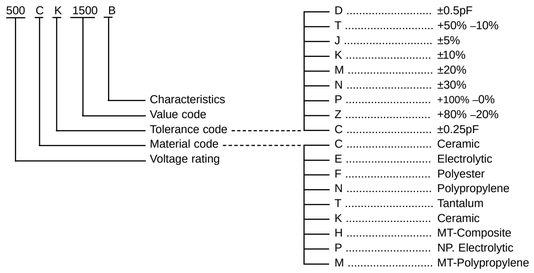
B ... BASE
C ... COLLECTOR
E ... EMITTER

CHIP RESISTORS

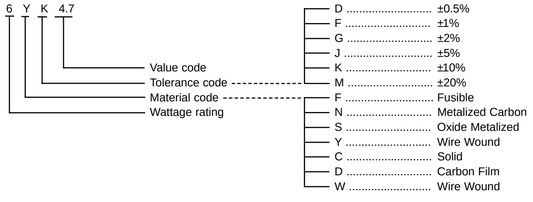
TOP VIEW

CAPACITOR AND RESISTOR CODE CHART

CAPACITOR (Example)

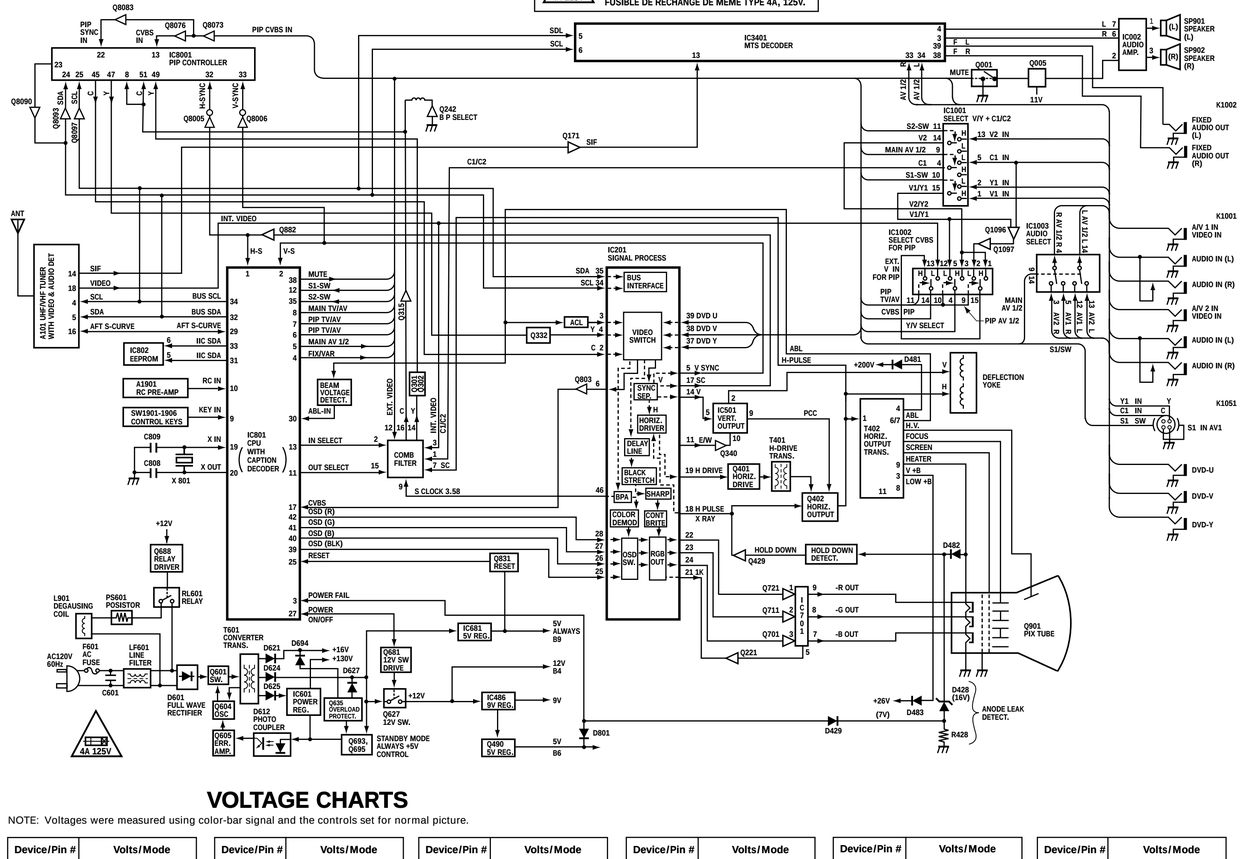


RESISTOR (Example)



BLOCK DIAGRAM

CAUTION
4A 125V
FOR CONTINUED PROTECTION AGAINST A RISK OF FIRE, REPLACE ONLY WITH THE SAME TYPE 4A, 125V FUSE.
ATTENTION: POUR MAINTENIR LA PROTECTION CONTRE LES RISQUES D' INCENDIE UTILISER UN FUSIBLE DE RECHANGE DE MEME TYPE 4A, 125V.



VOLTAGE CHARTS

NOTE: Voltages were measured using color-bar signal and the controls set for normal picture.

Device/Pin #	Volts/Mode	
D612-1	POWER ON: 31.9	POWER OFF: 10.9
D612-2	POWER ON: 31.0	POWER OFF: 9.8
D612-3	POWER ON: –.3	POWER OFF: 0.6
D612-4	POWER ON: 13.3	POWER OFF: 1.4
IC002-1	4.5	
IC002-2	10.3	
IC002-3	4.6	
IC002-4	GND	
IC002-5	0	
IC002-6	1.4	
IC002-7	1.4	
IC002-8	GND	
IC201-1	3.5	
IC201-2	5.3	
IC201-3	4.5	
IC201-4	5.3	
IC201-5	4.9	
IC201-6	4.5	
IC101-7	0	
IC201-8	3.6	
IC201-9	5.3	
IC201-10	GND	
IC201-11	3.7	
IC201-12	2.4	
IC201-13	3.5	
IC201-14	3.6	
IC201-15	5.6	
IC201-16	7.6	
IC201-17	0.8	
IC201-18	3.5	
IC201-19	2.5	
IC201-20	2.5	
IC201-21	3.7	
IC201-22	1.3	
IC201-23	1.5	
IC201-24	0.9	
IC201-25	0	
IC201-26	4.7	
IC201-27	4.7	
IC201-28	4.7	
IC201-29	GND	
IC201-30	4.1	
IC201-31	4.1	
IC201-32	4.1	
IC201-33	9.0	
IC201-34	3.8	
IC201-35	3.9	
IC201-36	0	
IC201-37	4.6	
IC201-38	5.3	
IC201-39	5.3	
IC201-40	GND	
IC201-41	5.3	
IC201-42	8.9	
IC201-43	5.3	

Device/Pin #	Volts/Mode	
IC201-44	9.1	
IC201-45	5.6	
IC201-46	4.8	
IC201-47	1.8	
IC201-48	0	
IC301-1	0.9	
IC301-2	4.8	
IC301-3	2.0	
IC301-4	0	
IC301-5	5.1	
IC301-6	5.1	
IC301-7	0.3	
IC301-8	–0.3	
IC301-9	0.6	
IC301-10	0	
IC301-11	0	
IC301-12	1.5	
IC301-13	GND	
IC301-14	1.9	
IC301-15	0	
IC301-16	1.5	
IC486-1	11.6	
IC486-2	GND	
IC486-3	9.1	
IC501-1	GND	
IC501-2	13.7	
IC501-3	27.1	
IC501-4	2.9	
IC501-5	2.9	
IC501-6	26.2	
IC501-7	3.0	
IC501-8	2.9	
IC501-9	2.9	
IC501-10	13.3	
IC601-1	POWER ON: 129.2	POWER OFF: 92.5
IC601-2	POWER ON: 31.1	POWER OFF: 9.8
IC601-3	GND	
IC681-1 (IN)	POWER ON: 11.6	POWER OFF: 7.3
IC681-2	GND	
IC681-3 (OUT)	POWER ON: 5.0	POWER OFF: 5.0
IC701-1	1.9	
IC701-2	1.8	
IC701-3	1.9	
IC701-4	GND	
IC701-5	4.3	
IC701-6	2.1	
IC701-7	185	
IC701-8	164	
IC701-9	149	
IC801-1	4.0	
IC801-2	3.9	
IC801-3	4.9	
IC801-4	9.1	
IC801-5	0	
IC801-6	0	

Device/Pin #	Volts/Mode	
IC801-7	0	
IC801-8	0.3	
IC801-9	0	
IC801-10	4.9	
IC801-11	0	
IC801-12	4.8	
IC801-13	4.9	
IC801-14	4.9	
IC801-15	1.9	
IC801-16	0.2	
IC801-17	2.1	
IC801-18	GND	
IC801-19	2.2	
IC801-20	2.0	
IC801-21	GND	
IC801-22	4.9	
IC801-23	0.2	
IC801-24	0.2	
IC801-25	4.8	
IC801-26	0.3	
IC801-27	POWER ON: 4.9	POWER OFF: 0
IC801-28	2.3	
IC801-29	2.6	
IC801-30	0	
IC801-31	4.9	
IC801-32	3.6	
IC801-33	4.9	
IC801-34	3.7	
IC801-35	4.8	
IC801-36	4.9	
IC801-37	4.9	
IC801-38	0	
IC801-39	0	
IC801-40	0	
IC801-41	0	
IC801-42	0	
IC802-1	GND	
IC802-2	GND	
IC802-3	GND	
IC802-4	GND	
IC802-5	4.9	
IC802-6	4.9	
IC802-7	GND	
IC802-8	4.9	
IC1001-1	0	
IC1001-2	0	
IC1001-3	6.5	
IC1001-4	6.5	
IC1001-5	6.5	
IC1001-6	GND	
IC1001-7	GND	
IC1001-8	GND	
IC1001-9	0	
IC1001-10	0	
IC1001-11	9.3	
IC1001-12	0.7	
IC1001-13	2.5	

Device/Pin #	Volts/Mode
IC1001-14	2.5
IC1001-15	0
IC1001-16	9.3
IC1002-1	6.3
IC1002-2	6.2
IC1002-3	2.4
IC1002-4	2.7
IC1002-5	2.7
IC1002-6	GND
IC1002-7	GND
IC1002-8	GND
IC1002-9	0
IC1002-10	0
IC1002-11	0
IC1002-12	6.0
IC1002-13	6.2
IC1002-14	6.0
IC1002-15	6.2
IC1002-16	9.1
IC1003-1	0.2
IC1003-2	0.3
IC1003-3	0
IC1003-4	0
IC1003-5	0
IC1003-6	GND
IC1003-7	GND
IC1003-8	GND
IC1003-9	0
IC1003-10	0.3
IC1003-11	0
IC1003-12	0
IC1003-13	0
IC1003-14	0
IC1003-15	0.4
IC1003-16	9.1
IC3401-1	4.1
IC3401-2	4.1
IC3401-3	4.1
IC3401-4	4.1
IC3401-5	3.6
IC3401-6	3.7
IC3401-7	GND
IC3401-8	4.1
IC3401-9	4.1
IC3401-10	4.1
IC3401-11	4.1
IC3401-12	4.9
IC3401-13	4.1
IC3401-14	1.3
IC3401-15	1.3
IC3401-16	0
IC3401-17	GND
IC3401-18	3.2
IC3401-19	9.1
IC3401-20	0
IC3401-21	4.1

Device/Pin #	Volts/Mode
IC3401-22	4.1
IC3401-23	3.7
IC3401-24	3.9
IC3401-25	4.1
IC3401-26	4.1
IC3401-27	4.1
IC3401-28	1.9
IC3401-29	4.1
IC3401-30	4.1
IC3401-31	2.0
IC3401-32	4.1
IC3401-33	4.1
IC3401-34	4.1
IC3401-35	0
IC3401-36	4.1
IC3401-37	4.1
IC3401-38	4.1
IC3401-39	4.1
IC3401-40	4.1
IC3401-41	4.1
IC3401-42	GND
IC3401-43	4.1
IC3401-44	4.1
IC3401-45	4.2
IC3401-46	GND
IC3401-47	4.1
IC3401-48	4.1
IC8001-1	GRD
IC8001-2	2.1
IC8001-3	1.6
IC8001-4	1.8
IC8001-5	1.6
IC8001-6	3.2
IC8001-7	3.2
IC8001-8	0.9
IC8001-9	1.4
IC8001-10	0.5
IC8001-11	GND
IC8001-12	3.2
IC8001-13	0.8
IC8001-14	1.4
IC8001-15	0.5
IC8001-16	GRD
IC8001-17	3.1
IC8001-18	GRD
IC8001-19	3.1
IC8001-20	N.C.
IC8001-21	0
IC8001-22	0.2
IC8001-23	0.1
IC8001-24	0.3
IC8001-25	2.2
IC8001-26	GND
IC8001-27	3.1
IC8001-28	N.C.
IC8001-29	0
IC8001-30	GND
IC8001-31	N.C.
IC8001-32	0.4

Device/Pin #	Volts/Mode
IC8001-33	0.3
IC8001-34	3.1
IC8001-35	3.1
IC8001-36	GND
IC8001-37	3.0
IC8001-38	0.9
IC8001-39	2.9
IC8001-40	1.2
IC8001-41	1.2
IC8001-42	GND
IC8001-43	0.9
IC8001-44	3.2
IC8001-45	0.9
IC8001-46	3.2
IC8001-47	1.0
IC8001-48	GND
IC8001-49	1.0
IC8001-50	GND
IC8001-51	0.9
IC8001-52	GND
Q001-B	POWER ON: 0 / POWER OFF: 0.7
Q001-C	POWER ON: 7.7 / POWER OFF: 0
Q001-E	GND
Q171-B	2.8
Q171-C	5.1
Q171-E	2.2
Q221-B	2.2
Q221-C	0
Q221-E	4.4
Q242-B	0
Q242-C	0
Q242-E	GND
Q271-B	9.4
Q271-C	0
Q271-E	9.3
Q301-B	5.1
Q301-C	9.3
Q301-E	4.4
Q302-B	4.4
Q302-C	0
Q302-E	5.1
Q315-B	1.5
Q315-C	0
Q315-E	2.2
Q332-B	5.1
Q332-C	GND
Q332-E	5.8
Q333-B	5.4
Q333-C	9.1
Q333-E	5.1
Q340-B	3.1
Q340-C	GND
Q340-E	3.7
Q401-B	0.3
Q401-C	43.6
Q401-E	GND

Device/Pin #	Volts/Mode	
Q402-B	–0.1	
Q402-C	125.26	
Q402-E	GND	
Q490-B	5.9	
Q490-C	6.9	
Q490-E	5.2	
Q601-B	POWER ON: –0.3	POWER OFF: 0
Q601-C	POWER ON: 155.0	POWER OFF: 169.6
Q601-E	GND	
Q604-B	POWER ON: –0.4	POWER OFF: 0.6
Q604-C	POWER ON: –0.3	POWER OFF: 0
Q604-E	GND	
Q605-B	POWER ON: 13.1	POWER OFF: 1.4
Q605-C	POWER ON: –0.4	POWER OFF: 0.6
Q605-E	POWER ON: 13.0	POWER OFF: 2.0
Q627-B	POWER ON: 11.1	POWER OFF: 7.3
Q627-C	POWER ON: 11.6	POWER OFF: 1.0
Q627-E	POWER ON: 11.9	POWER OFF: 7.3
Q635-B	POWER ON: 4.2	POWER OFF: 1.4
Q635-C	POWER ON: 31.1	POWER OFF: 9.8
Q635-E	POWER ON: 4.2	POWER OFF: 1.4
Q681-B	POWER ON: 0.7	POWER OFF: 0
Q681-C	POWER ON: 0	POWER OFF: 7.3
Q681-E	GND	
Q688-B	POWER ON: 12.6	POWER OFF: 1.0
Q688-C	POWER ON: 0	POWER OFF: 0
Q688-E	POWER ON: 12.5	POWER OFF: 1.0
Q693-B	POWER ON: 0.5	POWER OFF: 6.2
Q693-C	POWER ON: 30.9	POWER OFF: 8.9
Q693-E	POWER ON: 0.4	POWER OFF: 5.7
Q695-B	POWER ON: 30.9	POWER OFF: 9.6
Q695-C	GND	
Q695-E	POWER ON: 31.0	POWER OFF: 9.8

Device/Pin #	Volts/Mode
Q701-B	1.3
Q701-C	GND
Q701-E	1.9
Q711-B	1.2
Q711-C	GND
Q711-E	1.9
Q721-B	1.2
Q721-C	GND
Q721-E	1.9
Q803-B	4.4
Q803-C	GND
Q803-E	5.1
Q831-B	4.3
Q831-C	4.9
Q831-E	4.9
Q882-B	0
Q882-C	4.2
Q882-E	0
Q1096-B	5.9
Q1096-C	9.1
Q1096-E	6.2
Q1097-B	5.9
Q1097-C	9.1
Q1097-E	5.3
Q8000-B	3.9
Q8000-C	4.2
Q8000-E	3.2
Q8005-B	0.6
Q8005-C	0.3
Q8005-E	GND
Q8006-B	0.6
Q8006-C	0.2
Q8006-E	GND
Q8073-B	4.3
Q8073-C	9.0
Q8073-E	0
Q8076-B	3.7
Q8076-C	GND
Q8076-E	4.4
Q8083-B	2.9
Q8083-C	0.2
Q8083-E	3.1
Q8090-B	0
Q8090-C	3.4
Q8090-E	GND
Q8093-B	1.8
Q8093-C	2.1
Q8093-E	3.4
Q8097-B	1.9
Q8097-C	2.2
Q8097-E	3.3

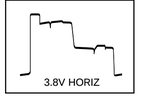
WAVEFORMS

NOTE: Waveforms were taken with color-bar signal and the controls set for normal picture.

IC201- (22) (R-Output)

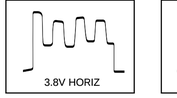
3.7V HORIZ

IC201- (23) (G-Output)



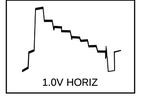
3.8V HORIZ

IC201- (24) (B-Output)



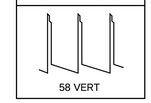
3.8V HORIZ

Q332- B (Selected Video)



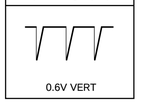
1.0V HORIZ

IC501- (2) (Vertical Output)



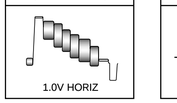
58 VERT

IC501- (5) (Inverting Input)



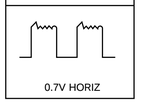
0.6V VERT

TPV (Internal Video)



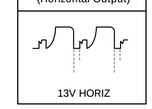
1.0V HORIZ

Q401- B (Horizontal Drive)



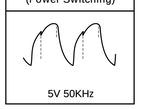
0.7V HORIZ

Q402- B (Horizontal Output)



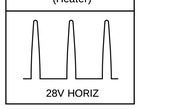
13V HORIZ

Q601- B (Power Switching)



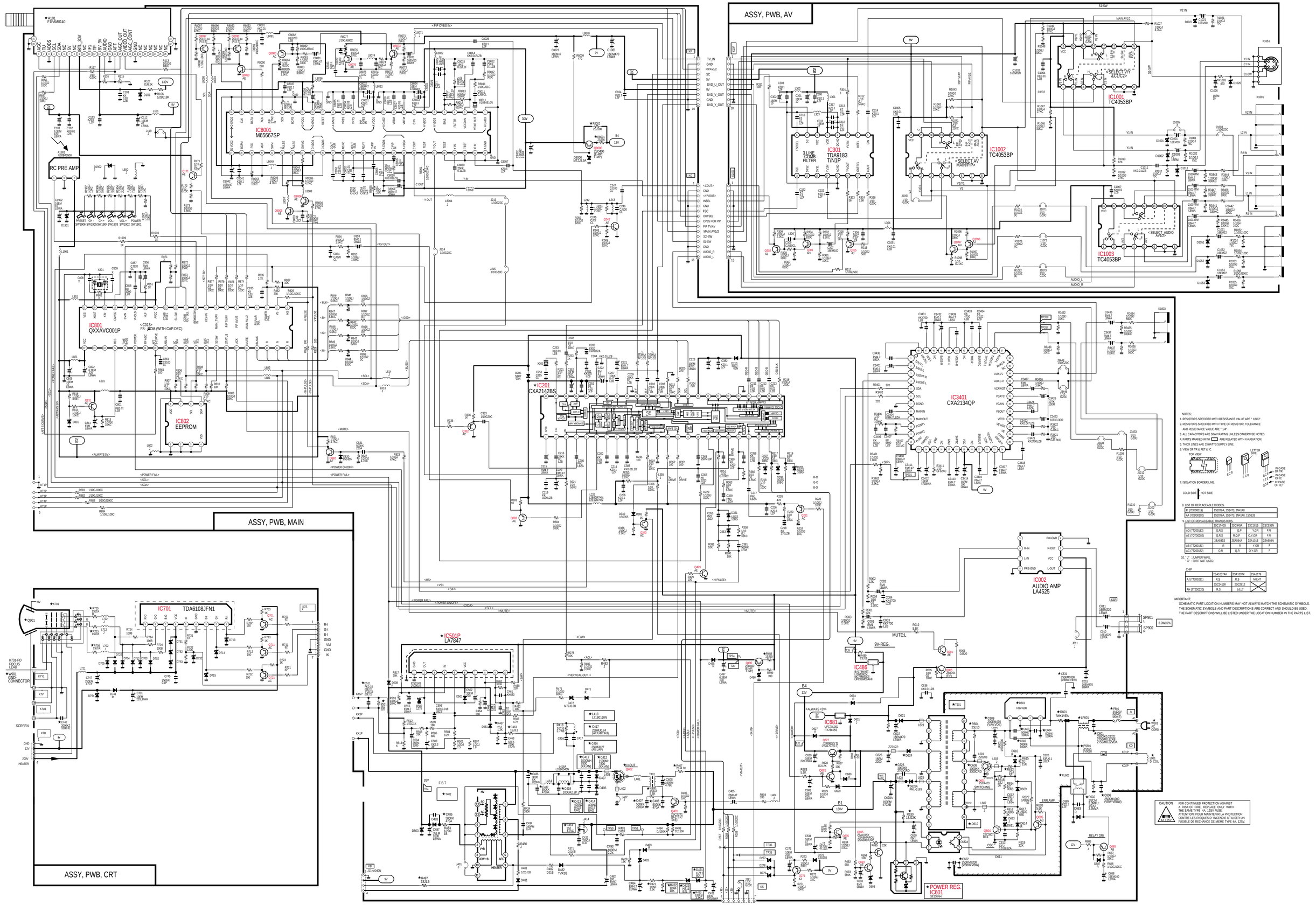
5V 50KHz

T402- (9) (Heater)



28V HORIZ

MODEL DS31820 **Chassis No. 31820-00**


ASSY, PWB, MAIN
ASSY, PWB, AV
ASSY, PWB, CRT
IC8001 M65667SP
IC801 QXXAVC001P
IC802 EEPROM
IC201 CXA2142BS
IC301 3 LINE COMB FILTER TDA9183 T/N1P
IC1001 TC4053BP
IC1002 TC4053BP
IC1003 TC4053BP
IC3401 CXA2134QP
IC002 AUDIO AMP LA4525
IC681 UPC78L05J TA78L05S
IC701 TDA6108JFN1
★IC501P LA7847
RC PRE AMP
SCREEN
K701-FO FOCUS LEAD
★W901 GND CONNECTOR
★ POWER REG. IC601
SE130N4
CAUTION FOR CONTINUED PROTECTION AGAINST A RISK OF FIRE, REPLACE ONLY WITH THE SAME TYPE 4A, 125V FUSE. ATTENTION: POUR MAINTENIR LA PROTECTION CONTRE LES RISQUES D' INCENDIE UTILISER UN FUSIBLE DE RECHANGE DE MEME TYPE 4A, 125V.
NOTES:
1. RESISTORS SPECIFIED WITH RESISTANCE VALUE ARE " 1/6Ω ".
2. RESISTORS SPECIFIED WITH TYPE OF RESISTOR, TOLERANCE AND RESISTANCE VALUE ARE " 1/4 ".
3. ALL CAPACITORS ARE 50WV RATING UNLESS OTHERWISE NOTED.
4. PARTS MARKED WITH ★ ARE RELATED WITH X-RADIATION.
5. THICK LINES ARE 19WITS SUPPLY LINE.
6. VIEW OF TR & FET & IC.
TOP VIEW
7. ISOLATION BORDER LINE.
COLD SIDE | HOT SIDE
8. LIST OF REPLACEABLE DIODES.
R: (TD000019) 1S2076A, 1S2473, 1N4148
AA (TD000192) 1S2076A, 1S2473, 1N4148, 1SS133
9. LIST OF REPLACEABLE TRANSISTORS.
AD (TT200183) 2SC2240B, 2SC945A, 2SC1815, 2SC536N
AE (TQ700202) Q,R,S, R,Q,P, O,Y,GR, F,G
2SA933S, 2SA564A, 2SA1015, 2SA608N
AB (TT200181) R, R, Y,GR, F
AC (TT200182) Q,R, Q,R, O,Y,GR, F
10. " J " : JUMPER WIRE
" X " : PART NOT USED.
CHIP
AJ (TT200221) 2SA1037AK, 2SA1037K, 2SA1179
R,S, R,S, MB,MD
2SC2412K, 2SC2812
AH (TT200220) R,S, L6,L7
IMPORTANT:
SCHEMATIC PART LOCATION NUMBERS MAY NOT ALWAYS MATCH THE SCHEMATIC SYMBOLS.
THE SCHEMATIC SYMBOLS AND PART DESCRIPTIONS ARE CORRECT AND SHOULD BE USED.
THE PART DESCRIPTIONS WILL BE LISTED UNDER THE LOCATION NUMBER IN THE PARTS LIST.